Vol. 924 Number 4

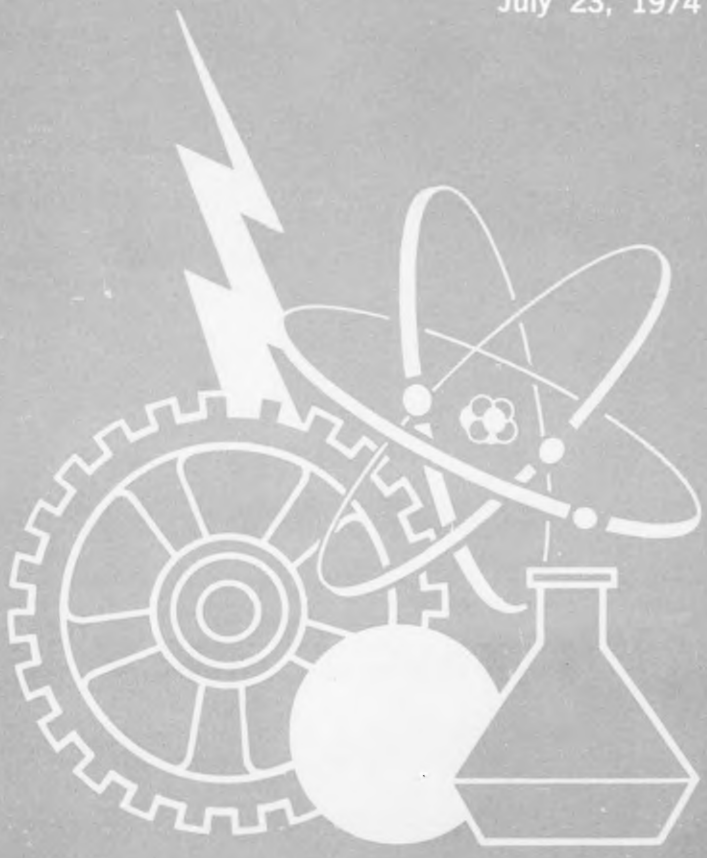
A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

OFFICIAL GAZETTE

of the
UNITED STATES PATENT OFFICE

PATENTS

July 23, 1974



U. S. DEPARTMENT OF COMMERCE
Patent Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

July 23, 1974 Volume 924 Number 4

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PATENT OFFICE NOTICES

Return to Printing of Claims in Patent Official Gazette

In the notice of May 22, 1972 (899 O.G. 820) interested parties were requested to submit written comments as to whether claims or abstracts should be printed in the Patent OFFICIAL GAZETTE. In view of the comments received, the Patent Office has decided to return to the pre-1968 practice of printing the broadest claim or claims, as selected by the examiner, in the Patent OFFICIAL GAZETTE. The printing of claims will begin with the October 1, 1974 issue of the Patent OFFICIAL GAZETTE. Abstracts will continue to be printed on patents.

C. MARSHALL DANN,
Commissioner of Patents.

Short Titles for International Trademark Classes

The United States Patent Office will, effective immediately, associate the following word titles with the respective international trademark class numbers:

GOODS

1 Chemicals
2 Paints
3 Cosmetics and cleaning preparations
4 Lubricants and fuels
5 Parmaceuticals
6 Metal goods
7 Machinery
8 Hand tools
9 Electrical and scientific apparatus
10 Medical apparatus
11 Environmental control apparatus
12 Vehicles
13 Firearms
14 Jewelry
15 Musical instruments
16 Paper goods and printed matter
17 Rubber goods
18 Leather good
19 Non-metallic building materials
20 Furniture and articles not otherwise classified
21 Housewares and glass
22 Cordage and fibers
23 Yarns and threads
24 Fabrics
25 Clothing
26 Fancy goods
27 Floor coverings
28 Toys and sporting goods
29 Meats and processed foods
30 Staple foods
31 Natural agricultural products
32 Light beverages
33 Wines and spirits
34 Smokers' articles

SERVICES

35 Advertising and business
36 Insurance and financial
37 Construction and repair
38 Communication
39 Transportation and storage
40 Material treatment
41 Education and entertainment
42 Miscellaneous

These short titles are not an official part of the international classification. Their purpose is to provide a means by which the general content of numbered international classes can be quickly identified. Therefore the titles selected consist of short terms which generally correspond to the major content of each class but which are not intended to be more than merely suggestive of the content. Because of their nature these titles will not necessarily disclose the classification of specific items. The titles are not designed to be used for classification but only as information to assist in the identification of numbered classes. For determining classification of particular goods and services and for full disclosure of the contents of international classes, it is necessary to refer to the Alphabetical List of Goods and Services and to the names of international classes and the explanatory notes in the volume entitled "International Classification of Goods and Services to Which Trade Marks Are Applied," published by the World Intellectual Property Organization (WIPO). The full names of international classes appear also in Section 6.1 of the Trademark Rules of Practice.

The short titles are being printed in the OFFICIAL GAZETTE in association with the international class numbers under MARKS PUBLISHED FOR OPPOSITION, Sections 1 and 2, under TRADEMARK REGISTRATIONS ISSUED, PRINCIPAL REGISTER, Section 1, and under SUPPLEMENTAL REGISTER, Sections 1 and 2.

Adoption of the international classification by the United States as its system of classification was announced in the OFFICIAL GAZETTE of June 26, 1973 (911 O.G. TM 210).

Date: June 18, 1974.

RENE D. TEGTMEYER,
Assistant Commissioner for Trademarks.

Certificates of Correction for the Week of July 23, 1974

P.P. 3,212	3,760,277	3,773,096	3,783,124
P.P. 3,469	3,760,841	3,773,151	3,783,172
Re. 27,748	3,761,442	3,773,899	3,783,624
3,507,618	3,761,682	3,775,123	3,783,945
3,532,519	3,762,598	3,775,252	3,784,288
3,578,367	3,763,934	3,775,959	3,784,294
3,582,812	3,764,212	3,776,687	3,785,342
3,598,691	3,764,516	3,776,966	3,785,848
3,644,463	3,764,531	3,777,169	3,785,944
3,646,586	3,765,076	3,777,361	3,786,319
3,684,390	3,765,288	3,777,511	3,787,362
3,686,211	3,765,403	3,777,556	3,787,809
3,689,137	3,765,488	3,778,157	3,787,818
3,690,680	3,765,585	3,778,231	3,787,932
3,700,349	3,766,021	3,778,241	3,788,237
3,711,487	3,766,250	3,778,437	3,788,906
3,721,171	3,766,837	3,778,474	3,790,392
3,727,537	3,767,599	3,778,619	3,790,475
3,729,467	3,767,619	3,778,869	3,791,439
3,732,360	3,767,699	3,778,928	3,791,558
3,736,944	3,767,756	3,779,143	3,791,775
3,739,154	3,768,487	3,779,283	3,791,882
3,740,448	3,768,560	3,779,526	3,791,968
3,741,072	3,768,666	3,779,829	3,792,099
3,741,874	3,768,667	3,779,883	3,792,177
3,741,918	3,769,271	3,780,337	3,796,273
3,749,425	3,769,581	3,780,837	3,796,336
3,749,582	3,770,310	3,780,879	3,796,341
3,750,830	3,770,419	3,780,951	3,796,371
3,751,561	3,770,573	3,781,248	3,796,455
3,752,090	3,770,698	3,781,514	3,796,545
3,752,667	3,770,888	3,781,616	3,796,584
3,752,745	3,771,361	3,781,796	3,796,636
3,753,694	3,771,524	3,782,208	3,796,800
3,754,926	3,771,546	3,782,428	3,796,872
3,755,484	3,772,477	3,782,925	3,796,896
3,757,097	3,772,510	3,782,960	
3,758,647	3,772,865	3,782,987	

PATENT EXAMINING CORPS

WILLIAM FELDMAN, Acting Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 6, 1974

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	7-19-73
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	6-18-73
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	11-15-73
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. L. LEAVITT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	8-23-73
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-3-73
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	11-28-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-1-73
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	11-1-73
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	4-11-73
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-10-73
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	1-12-73
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-2-74
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	10-17-73
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. PULFREY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	11-2-73
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	9-10-73
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	11-1-73

Expiration of patents: The patents within the range of numbers indicated below expire during July 1974, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,797,414 to 2,801,413, inclusive
Plant Patents..... Numbers 1,612 to 1,625, inclusive

REISSUES

JULY 23, 1974

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

28,078

INSULATED ALUMINUM ALLOY MAGNET WIRE

Roger J. Schoerner, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Original No. 3,513,252, dated May 19, 1970, Ser. No. 814,201, Apr. 7, 1969, which is a continuation-in-part of application Ser. No. 795,038, Jan. 29, 1969, which is a continuation-in-part of application Ser. No. 779,376, Nov. 27, 1968, which in turn is a continuation-in-part of application Ser. No. 730,933, May 21, 1968, all now abandoned. Application for reissue Oct. 12, 1972, Ser. No. 296,941

Int. Cl. H01b *5/08*

U.S. Cl. 174—120 SR 20 Claims

An insulated solid magnet wire, prepared from an aluminum alloy wire having an acceptable electrical conductivity of at least sixty-one percent (61%) based on the International Annealed Copper Standard and a minimum of fifteen percent (15%) ultimate elongation, has improved physical properties of increased tensile strength and fatigue resistance when compared to conventional magnet wire. The aluminum alloy wire contains substantially evenly distributed iron aluminate inclusions in a concentration produced by the addition of more than about 0.30 weight percent iron and no more than 0.15 weight percent silicon to an alloy mass containing less than about 99.70 weight percent aluminum and trace quantities of conventional impurities normally found within a commercial aluminum alloy. The substantially evenly distrbuted iron aluminate inclusions are obtained by continuously casting an alloy consisting essentially of less than about 99.70 weight percent aluminum, more than 0.30 weight percent iron, no more than 0.15 weight percent silicon and trace quantities of typical impurities to form a continuous aluminum alloy bar, hot-working the bar substantaillly immediately after casting in substantially that condition in which the bar is cast to form continuous rod which is subsequently drawn into wire without intermediate anneals and annealed after the final draw. After annealing, the wire has the aforementioned novel and unexpected properties of a minimum of fifteen percent (15%) ultimate elongation, electrical conductivity of at least sixty-one percent (61%) of the International Annealed Copper Standard and increased tensile strength, bendability and fatigue resistance.

28,079

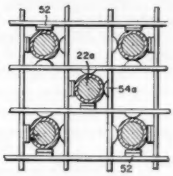
MEANS FOR SUPPORTING FUEL ELEMENTS IN A NUCLEAR REACTOR

Harry N. Andrews, Murrysville, and Herbert W. Keller, Monroeville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Original No. 3,379,617, dated Apr. 23, 1968, Ser. No. 458,634, May 25, 1965. Application for reissue June 15, 1971, Ser. No. 153,203

Int. Cl. G21c *3/32*

U.S. Cl. 176—78 30 Claims



1. A grid structure for a nuclear reactor fuel assembly comprising a plurality of connecting members forming [respective openings] *peripheral and inner fuel element openings* through *each of which openings an* [which] elongated *fuel* [elements are] *elements is* adapted to extend, at least two rigid spaced projections extending into each of [at least some of] said *peripheral and inner* [grid] *fuel element* openings from at least one of said members, and at least one resilient means extending into each of said [some] *peripheral and inner* openings from at least another of said members and disposed generally opposite to said two rigid projections with its innermost protrusion being positioned in alignment with the region intermediate said spaced projections.

28,080

HOT TOP CASING FOR CASTING MOLDS

Per Davidson, Sandviken, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden

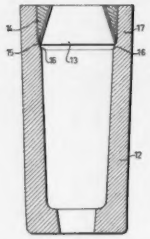
Original No. 3,072,981, dated Jan. 15, 1963, Ser. No. 861,098, Dec. 21, 1959. Reissue No. 25,915, dated Nov. 23, 1965, Ser. No. 438,446, Jan. 5, 1965. This application for reissue June 7, 1971, Ser. No. 150,005

Int. Cl. B22d *7/10*

U.S. Cl. 106—38.23 11 Claims

A hot top casing for an ingot casting mold consisting of a molded mixture containing 2 to 15% by weight fibrous organic material, 4 to 10% by weight organic binder, up to 4% by weight inorganic fibrous material, and the balance a granular fireproof material. Suitable fireproof materials are refractory silicates such as quartz

and sand, burned dolomite, and cinders. The fireproof material preferably has an average grain size within the range



of from 0.6 to 0.05 mm. The organic fibrous material is preferably paper pulp or mechanical pulp.

28,081

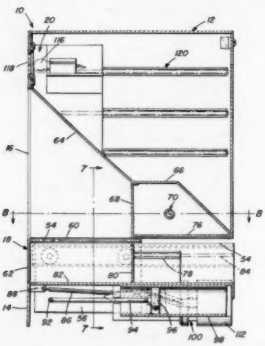
ELECTRONIC CREDIT CARD ACCEPTOR

Jerry E. Travioli, Jackson, Mich., assignor to Transaction Technology, Inc., Cambridge, Mass.

Original No. 3,536,894, dated Oct. 27, 1970, Ser. No. 474,239, July 23, 1965. Application for reissue Oct. 26, 1972, Ser. No. 300,891

Int. Cl. G01n *21/30;* G06k *7/12, 19/02, 21/04*

U.S. Cl. 235—61.11 E 21 Claims



Apparatus for rapidly determining the credit of a person bearing a credit card by means of a credit checking computer wherein the credit card incorporates infra red transmitting portions for transmitting infra red radiation emitting from an infra red radiation source to reading means producing signal pulses which are fed to the computer, and the computer produces output signals indicating the credit condition pertaining to the card read.

28,082

MEANS FOR ADJUSTING THE ANGULAR RELATION BETWEEN A WORKPIECE TO BE GROUND AND A TOOL

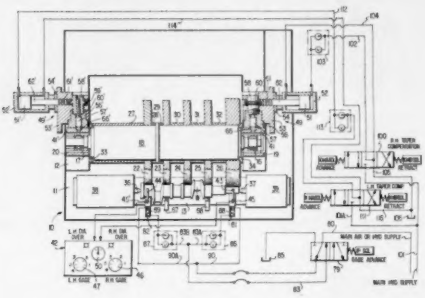
Ralph E. Price, Waynesboro, Pa., assignor to Landis Tool Company

Original No. 3,690,072, dated Sept. 12, 1972, Ser. No. 98,807, Jan. 16, 1970. Application for reissue Feb. 1, 1973, Ser. No. 328,664

Int. Cl. B24b *49/04*

U.S. Cl. 51—165 R 10 Claims

An automatic taper compensator is used to maintain a parallel relationship between the axis of a wide grinding wheel or multiple grinding wheels (**22–26**) and the centerline of a cylindrical workpiece (W) on a grinding machine. Two gage heads (**43, 44**) are automatically advanced during the grinding cycle at the extreme ends of the workpiece portions being ground. A differential circuit (**48**) directly compares the voltage output of the right hand (R.H.) and the left hand



(L.H.) gage heads (**43, 44**) and generates a signal when the difference varies by more than a predetermined amount. Compensation is effected by deflecting the appropriate wheel spindle bearing support (**41** or **41'**) in a forward direction, as separate force applying means (**49, 49'**) are provided at each end of the wheel spindle (**18**) for that purpose.

28,083

ELECTROLYTIC PROCESS OF PREPARING PURE HYDROGEN

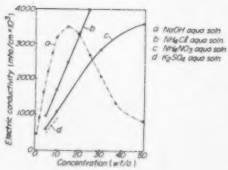
Mutsuaki Shinagawa, Amagasaki, and Hiroyuki Nezu, Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Original No. 3,458,412, dated July 29, 1969, Ser. No. 623,426, Mar. 15, 1967. Application for reissue Nov. 1, 1971, Ser. No. 194,762, which is a continuation of abandoned application Ser. No. 51,289, June 30, 1970

Claims priority, application Japan, Mar. 30, 1966, 41/20,482

Int. Cl. C01b *13/04*

U.S. Cl. 204—129 18 Claims



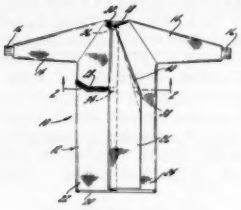
The preparation of pure hydrogen by electrolyzing water in a cell having a mercury cathode, the water being in an aqueous solution of an electrolyte such as ammonium salts where a semiconductor material having a forbidden band spacing less than 3.6 ev. is suspended. Examples of such semiconductors are Bi_2Te_3, Te, InAs, CdSb, Ge, Si, CdTe and Zns.

PATENTS

GRANTED JULY 23, 1974

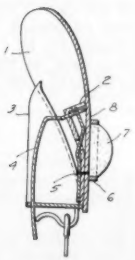
GENERAL AND MECHANICAL

3,824,625
DISPOSABLE GOWN WITH MULTIPLE FLAPS AND CLOSURES
Angelica G. Green, Fort Lee, N.J., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Continuation of Ser. No. 158,299, June 30, 1971, abandoned. This application Apr. 18, 1973, Ser. No. 352,244
Int. Cl. A41d *13/00*
U.S. Cl. 2—114 **1 Claim**



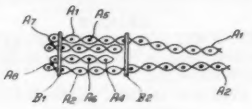
An adjustable wraparound gown comprising a body portion having a continuous front, a pair of sleeves and a neck opening, the back of which is comprised of two panels, one having a flap adapted to cover a substantial portion of the other panel when unfolded. The gown has means for adjustably fastening the panels together and for holding the flap in either a folded or unfolded position.

3,824,626
COLLAR ORNAMENT
Jose Ros Navarro, Rambla San Carlos, 20, Tarragona, Spain
Filed Mar. 2, 1973, Ser. No. 337,739
Claims priority, application Spain, June 5, 1972, 181136
Int. Cl. A41d *25/04*
U.S. Cl. 2—145 **7 Claims**



A collar ornament for collars of shirts, blouses and the like has a generally V-shaped ornamental member, provided with a rib extending along a lower edge portion of the inner side thereof, and also provided with a clamping arrangement fastened to the inner side releasably engaging a collar in the vicinity of the chin of a wearer.

3,824,627
NECK-TIE OR THE LIKE AND METHOD OF MANUFACTURE THEREOF
Nutrizio Maria Schon, and Loris Abate, both of Via Montenapoleone 2, Milan, Italy
Filed Dec. 5, 1972, Ser. No. 312,369
Claims priority, application Italy, Dec. 6, 1971, 32115/71
Int. Cl. A41d *25/06*
U.S. Cl. 2—146 **10 Claims**



A neck-tie or the like and a method for its manufacture, constituted of two superimposed layers or components of a textile fabric, the edges of which are folded and tucked between the layers of the fabric and joined by a row of stitches to form a rib around the edge of the neck-tie. At least one other edge of stitches may be located in parallel spaced relationship with the first row of stitches so as to define the extent of the edge region of the neck-tie.

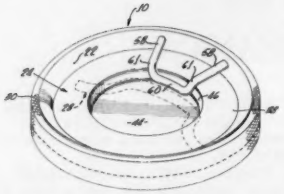
3,824,628
METHOD AND EQUIPMENT FOR SEWING
Patricia A. Bannister, 540 Bird Ave., San Jose, Calif. 95126
Filed June 7, 1973, Ser. No. 367,785
Int. Cl. A41d
U.S. Cl. 2—243 R **3 Claims**

Method of sewing employing a standard pattern with marking dots, applying pins through the pattern and goods at the marking dots, removing the pattern while leaving the pins, applying adhesive rings over each pin so as to adhere to the goods, carrying out any necessary folding (e.g., folding into a dart) along the lines mapped out by the adhesive rings, and sewing along such lines.

3,824,629
PIVOTED DISCOID HEART VALVE HAVING A CHANGING PIVOT AXIS
Donald P. Shiley, 11022 Huntington, Santa Ana, Calif.
Continuation of Ser. No. 809,754, March 24, 1969, abandoned. This application May 6, 1971, Ser. No. 140,900
Int Cl. A61f *1/22*
U.S. Cl. 3—1 **23 Claims**

A heart valve prosthesis having a discoid poppet mounted therein for pivotal movement between a closed and opened

position. The poppet is supported for movement by opposed, spaced support struts which form an eccentric pivot point for



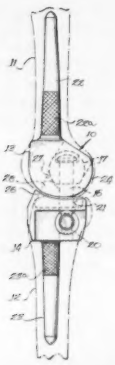
opening of the valve and a changing pivot point for closing of the valve. The spacing between the struts is sufficient to enable rotational movement of the poppet during operation.

3,824,630

PROSTHETIC JOINT FOR TOTAL KNEE REPLACEMENT

L. Lyle Johnston, Syracuse, Ind., assignor to Zimmer Manufacturing Co., Warsaw, Ind.

Filed June 23, 1972, Ser. No. 265,577
Int. Cl. A61f *1/24*
U.S. Cl. 3—1 **8 Claims**



The embodiment disclosed herein illustrates a joint prosthesis for total knee replacement. The joint prosthesis includes a first prosthetic member including a stem member adapted for insertion into a first skeleton element and further including a first joint-forming member at one end of the stem member to provide a convexly shaped articulation surface. A second prosthetic member includes a stem for insertion into a second skelton element disposed adjacent the first skeleton element and is also provided with a second joint-forming member at the other end thereof to provide a concavely shaped articulation surface. The convexly shaped articulation surface cooperates with the concavely shaped articulation surface by means of a connecting link having a ball joint at one end and a pivot joint at the other end. The movement of the prosthesis closely approximates that of the actual knee joint movement.

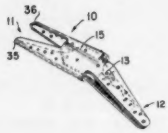
3,824,631

BONE JOINT FUSION PROSTHESIS

Albert H. Burstein, Shaker Heights, and Kingsbury G. Heiple, Cleveland, both of Ohio, assignors to The Sampson Corporation, Pittsburgh, Pa.

Filed May 11, 1973, Ser. No. 359,458
Int. Cl. A61f *1/24*
U.S. Cl. 3—1 **10 Claims**

A prosthesis for use in fusion of a bone joint especially for managing the severely disabled rheumatoid wrist. The prosthesis serves as a bridge across the joint and is formed of an appropriate metal of hollow construction and is bifurcated at one end to provide projections which are received within the medullary canal of two metacarpals and has an extension on the other end for reception within the radius. Methyl-



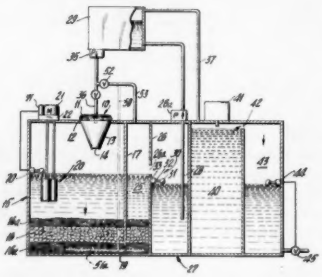
methacrylate or other appropriate settable cement is packed within and about the prosthesis to provide, upon setting, a strong, rigid joint bridge.

3,824,632

SELF-CONTAINED WATER CLOSET AND DIGESTER

Bert Bach, New York, N.Y., and Robert Lemcke, Middleton, Wis., assignors to Pure Way Corporation, East Moline, Ill.

Filed Oct. 6, 1972, Ser. No. 295,686
Int. Cl. E03d *5/016*; **Co2c** *1/16*; **C02c** *1/40*
U.S. Cl. 4—12 **4 Claims**



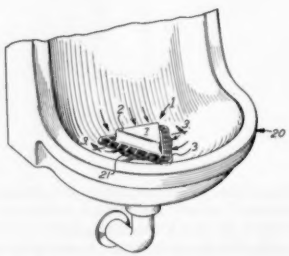
A water closet and digester are parts of a sewage disposal unit that includes filter beds, tanks for bacterial action, and a recirculating flushing water line. The solid wastes can be disintegrated by a mascerator. In one embodiment the mascerator applies pressure to the waste by using motor driven rollers having flexible surfaces.

3,824,633

DISPENSER ASSEMBLY AND METHOD

Eftichios Van Vlahakis, Northbrook, Ill., assignor to Venus Laboratories, Inc., Bensonville, Ill.

Filed Oct. 2, 1972, Ser. No. 294,102
Int. Cl. E03d *13/00*, *9/02*
U.S. Cl. 4—109 **10 Claims**



A disposable dispenser for fluid-soluble chemicals that must be slowly released at prescribed times, and a method of manu-

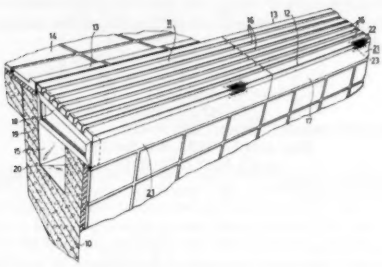
facture of the chemical and the dispenser in unitary form. The novel chemical composition has a relatively high melting point which permits it to be cast into a substantially imperforate protective cup in a fluid condition, and thereafter allowed to set, thereby becoming unitary with the dispenser. In one manufacture embodiment, the chemical solidifies around appropriate attaching means in the cup in a ready-for-use position. One embodiment of the article is a dispenser for antiseptic and/or deodorizing chemicals for a urinal. The chemical is protected from direct action of urine by a substantially imperforate, inverted cup in which the chemical is located. A perforated flange serves to support the dispenser cup in the desired location within the urinal while also serving to allow effective drainage of the urine. The fluid soluble chemical is released in desired amounts only at the effective time of flushing by the turbulence of the flush water. The chemical-water solution then uniformly washes and deodorizes the urine receptable to provide protection from odor, bacteria and disease. The chemical is not again released from the dispenser until flushing occurs at a later time.

3,824,634

ARRANGEMENT IN SWIMMING POOLS

Stig Ture Lindqvist, Farsta, Sweden, assignor to Ingenjorsfirman Vattenanlaggningar, Stockholm, Sweden

Filed Apr. 27, 1972, Ser. No. 248,306
Claims priority, application Sweden, Apr. 29, 1971, 5574/71
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172.17 **12 Claims**



An arrangement in swimming pools or bathing pools surrounded by a brim of which at least a portion thereof slopes downward towards the pool water so that its lower edge is located substantially on the same level as the surface of the pool water. A drainage channel for collecting and draining pool water is located beneath the sloping brim portion and the brim portion is provided with perforations to form a perforated cover member for the drainage channel.

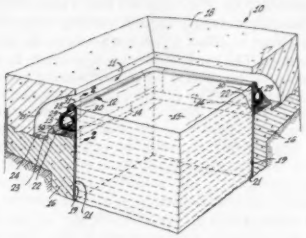
3,824,635

CIRCULATING HAND-HOLD FOR SWIMMING POOLS

Milton K. Spaulding, 2715 Exeter Pl., Santa Barbara, Calif. 93105

Filed Aug. 13, 1973, Ser. No. 387,744
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172.18 **12 Claims**

A water-circulating hand-hold for swimming pools and a method for fabricating the same, the hand-hold forming one side of a peripheral gutter into which the water is skimmed over a lip structure of the hand-hold, and also providing a conduit for the water which is recirculated to the pool through openings in the hand-hold. The hand-hold is formed in sections, each comprising a fiber glass shell molded around a length of pressure-tight, prefabricated pipe, and has a shaped lip structure above the pipe, over which water is skimmed from the pool into the gutter. The lip structure is filled with polyurethane foam, and the remaining space within the shell, below the pipe, is filled with a hard-setting resin. The resin forms a rigid base for the hand-hold, the sections of which are



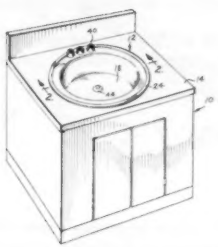
installed around the pool in end-to-end relation, joined by telescoped connecting sleeves and miter-shaped corner sections, and leveled by means of screw jacks.

3,824,636

WASH BASIN ADAPTED FOR SECUREMENT TO A SUPPORT

Glenn R. Brown, Bristol, Ind., assignor to Bristol Products, Inc., Bristol, Ind.

Filed July 3, 1972, Ser. No. 268,694
Int. Cl. E03c *1/32, 1/18*
U.S. Cl. 4—187 A **4 Claims**



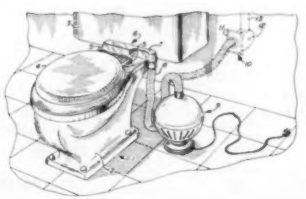
A wash basin having a liquid collecting part and a flanged part which extends peripherally about and outwardly from the upper margin of the liquid collecting part. The flanged part of the basin carries a pressure sensitive adhesive which allows the basin to be secured to the top of a support.

3,824,637

VENTILATING ATTACHMENT FOR WATER CLOSET

Clyde J. Hunnicutt, Jr., 3026 E. Garfield St., Phoenix, Ariz. 85008

Filed Nov. 8, 1972, Ser. No. 301,581
Int. Cl. A47k *3/22;* **E03d** *9/04, 13/00*
U.S. Cl. 4—213 **4 Claims**



In order to provide very efficient and effective ventilation of a water closet, a collector having an exhaust coupled to suc-

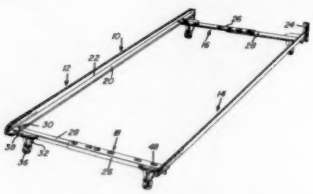
tion means is disposed directly beneath the seat at the rear thereof. The collector is held in place by and between the hinge bolts of the seat, and has a downwardly directed inlet opening which extends over the center rear portion of the bowl. A passageway, which is taller than its narrowest portion, extends laterally between the seat and the water reservoir of the water closet to effect a conduit between the inlet and exhaust openings. The exhaust opening is coupled, by means of a flexible hose, to the suction means comprising a motor driven centrifugal air pump. The air pump may discharge to a conduit leading outdoors or to another convenient discharge space, or the air from the bowl may be pulled by the suction pump through filtering means, such as activated charcoal, after which it is discharged into the local environment. With the latter configuration, a self-contained pump/filter unit is provided, and the activated charcoal is disposed within a chamber having a baffle which prevents "tunneling" of the flowing air through the charcoal after a period of use. The collector is provided with upwardly directed lips about both the inlet and exhaust openings to achieve a double trap against any water which might inadvertently enter the collector, thereby preventing any water from entering the flexible tubing to prevent electrical malfunctions of the motor driving the air pump.

3,824,638

ADJUSTABLE BED FRAME

Earl M. Bogar, Jr., P.O. Box 4152, Houston, Tex. 77014

Filed Aug. 21, 1972, Ser. No. 282,006
Int. Cl. A47c *19/04*
U.S. Cl. 5—181 **7 Claims**



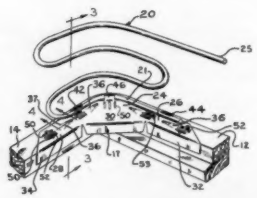
A bed frame for use in supporting a spring and mattress assembly in a Hollywood type bed which is foldable and adjustable to receive different sizes of bedding and provided with an insertable center support for use when supporting the largest standard size bedding.

3,824,639

SPRING LOCATING APPARATUS FOR BOX SPRING ASSEMBLIES

Jack C. Mandusky, Lexington, Ky., assignor to Hoover Ball and Bearing Company, Saline, Mich.

Continuation-in-part of Ser. No. 264,818, June 21, 1972, abandoned. This application May 17, 1973, Ser. No. 361,137
Int. Cl. A47c *23/02*
U.S. Cl. 5—260 **10 Claims**



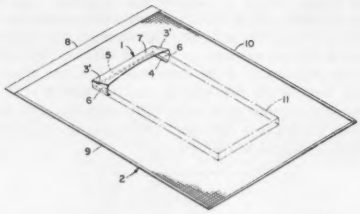
A corner assembly for a box spring frame which forms a reinforced corner and which supports and locates a corner spring element. The corner assembly can be in the form of an individual bracket which also connects wooden frame rails.

3,824,640

BED COVER

Clara Celia Golden, P.O. Box 63, Rockaway Park, Far Rockaway, New York, N.Y. 11694

Filed Dec. 11, 1972, Ser. No. 313,807
Int. Cl. A47g *9/00*
U.S. Cl. 5—334 C **2 Claims**



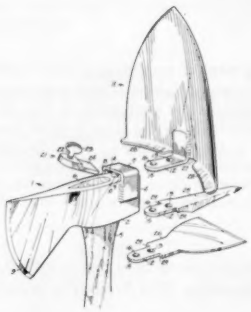
A bed cover consisting of a main section having longitudal and transverse dimensions long enough to cover the upper surface of the bed mattress and drape therefrom to the ground from the foot and sides thereof, and a pocket fastened to the underside of the main section at a point where the drape over the foot begins. The pocket is fastened so that its opened end runs across the transverse dimension of the main section and is sufficiently wide to accept the foot edge of the mattress with sufficient surplus space to accept the feet of the occupant of the bed.

3,824,641

CAMPING TOOL

Frederick Shandel, Albion, Calif. 95410

Filed July 31, 1972, Ser. No. 276,587
Int. Cl. B25f *1/02*; **B25g** *3/12*
U.S. Cl. 7—14.55 **7 Claims**



An ax with a flat top on its poll; a lug projecting from the top of the poll spaced from but near the heel of the poll; the lug has a substantially flat cavity extending longitudinally of the ax and has a prong extended from the poll inside the cavity. Several attachments for various camping implements have a flat securing flange slideably fitting into the lug cavity and each flange has a hole engageable with the prong in the cavity and an indentation on the portion of the flange projecting beyond said cavity. A securing wedge is insertable into said cavity oppositely to said flange so as to tightly fill the space between the flange and the top of the cavity in the lug and a

set screw on said wedge is engageable in said indentation in the flange in the securing position to hold the camping implement securely in position.

3,824,642

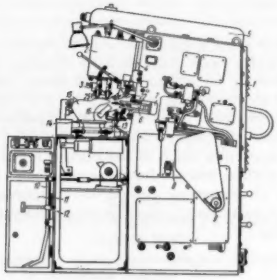
MACHINE FOR PULLING OVER AND CEMENT LASTING OF THE FOREPART OF A SHOE UPPER

Mikhail Dmitrievich Smirnov, Moskovsky prospekt, 175, kv. 7; Boris Alexandrovich Ershov, Drovyanoi pereulok, 10, kv. 17; Vladilen Nikolaevich Savitsky, Zanevsky prospekt, 32, kv. 83, all of Leningrad; Boris Dmitrievich Breev, Krasnopresnenskaya naberezhnaya, 1/2, kv. 28, Moscow; Anatoly Alexandrovich Atkarsky, Derbenevskaya naberezhnaya, 13/17, korpus 3, kv. 78, Moscow; Svyatoslav Viktorovich Shardakov, Samarkandsky bulvar, 32, korpus 1, kv. 106, Moscow; David Aronovich Sinajuk, Bolotnikovskaya ulitsa, 38, korpus 1, kv. 6, Moscow; Vladimir Nikolaevich Stukalov, ulitsa 111 Internatsionala 135, kv. 48, and Leonid Vasilievich Puzynya, prospekt Engelsa 22, kv. 5, both of Leningrad, all of U.S.S.R.

Filed July 10, 1973, Ser. No. 377,913

Int. Cl. A43d *21/00*

U.S. Cl. 12—10.5 **3 Claims**



A machine for pulling over and cement lasting of the forepart of a shoe upper is provided with a drafting head with lasting tools or pincers positioned above a last with a shoe upper thereon and mounted on power-driven slides adapted to advance the head together with the lasting tools in perpendicular directions for longitudinal drafting and transverse pulling over of a shoe upper on the last. One of said lasting tools is stationary with respect to the housing of the head, while the other tool, the toe one, is mounted on an individual slide adapted to advance this last-mentioned tool to underlie the toe part of the last and thus to grip the forepart of the upper. The machine is further provided with lasting plates spaced from the last and mounted on a power-driven slide adapted to advance the plates horizontally toward the last at lasting.

3,824,643

APPARATUS FOR APPLYING WELTING TO A SHOE COMPONENT

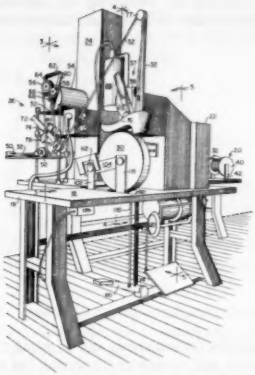
John Decoulos, Peabody, Mass., assignor to Boston Machine Works Co., Lynn, Mass.

Filed June 28, 1973, Ser. No. 374,508

Int. Cl. A43d *45/00*

U.S. Cl. 12—67 K **9 Claims**

Continuous welting, in sequence, is wetted with cement which is dried to provide a bonding stratum, is metered out to provide slack increments each equal in length to the perimeter of a shoe component, is advanced together with the perimeter of the shoe component through the nip between a pair of pressure applying wheels, is heated at the nip to reactivate the bonding stratum which causes the welting to adhere to the perimeter of the shoe component, and is severed at incremental demarcations. The wheels are designed specifically to advance the marginal edge of the shoe component and the welt through the nip and to apply pressure across any cross-sectional portion in the nip notwithstanding differences in the peripheral thicknesses of the shoe component.



3,824,644

FLOATING ELEMENT, FLOATING ASSEMBLY, AND CONNECTING BOLT

Hermann Stranzinger, Reitberg 40 A, 5301 Eugendorf, Austria

Filed Aug. 15, 1972, Ser. No. 280,834

Claims priority, application Austria, Aug. 19, 1971, 7240/71

Int. Cl. E01d *15/14*

U.S. Cl. 14—27 **10 Claims**

A floating element comprises a substantially prismatic, floatable body having a plurality of rounded corner edges, and a plurality of outwardly protruding eye lugs which are disposed on different levels, each lug being fixed to the body at one of its corner edges and being formed outwardly of the body with a hole adapted to register with a hole in a similar lug fixed to and protruding from an adjacent floating element. A connecting bolt comprises a conical head and a substantially cylindrical shank adapted to extend through the registering holes in eye lugs of adjacent floating elements for linking them together, the shank carrying projections which are interlockingly engageable with recesses in the corner edges upon rotation of the bolt from an insertion position into a retaining position.

3,824,645

SCRUBBING MACHINE

Keith N. Krier; Neil F. Brown, and Steven J. A. Waldhauser, all of Minneapolis, Minn., assignors to Tennant Company, Minneapolis, Minn.

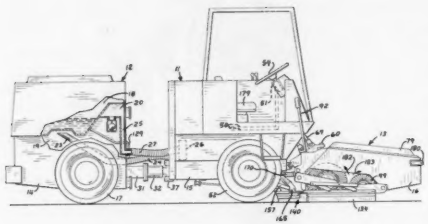
Filed May 22, 1972, Ser. No. 255,612

Int. Cl. A47l *11/292*

U.S. Cl. 15—50 C **40 Claims**

A scrubbing machine that includes an articulated vehicle having a power unit and a trailer unit coupled thereto, said trailer unit having cleaning and dirty solution tanks thereon, a

squeegee assembly on the power unit having a central liquid take-up tube and a second take-up tube at one end portion thereof, controls operated by turning the vehicle in the appropriate direction for switching the application of vacuum from the central tube to the second tube, a scrubber head unit



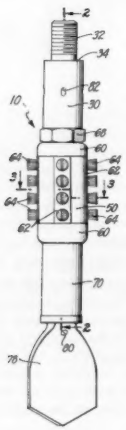
and an assembly for mounting and carrying the scrubber unit on the vehicle and raising and lowering the scrubber unit including an articulated joint to permit limited pivotal movement of the scrubber head about a generally vertical axis and an axis perpendicular thereto.

3,824,646

COMBINATION DRILLING AND BRUSHING TOOL IN A PIPE CLEANING MACHINE

Marlyse Janean Baldwin Jai, 3155 French Rd. Apt. 223, Beaumont, Tex. 77704

Filed Nov. 17, 1972, Ser. No. 307,337
Int. Cl. B08b *9/02*
U.S. Cl. 15—104.1 R **5 Claims**



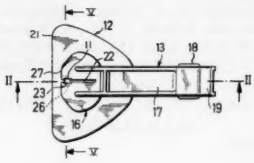
A machine for use in cleaning the interior of a pipe constructed so as to include a hollow rod, a cleaning tool located on one end of the rod, means for moving the rod in a lengthwise direction coupled to the other end of the rod, means for rotating the rod as it is so moved and means for conveying a fluid through the rod to adjacent to the cleaning tool may be improved through the use of a combination drilling and brushing tool as a cleaning tool. Such a drilling and brushing tool includes a hollow sleeve attached to the end of the rod, brushing elements located on the exterior of the sleeve and a cutting blade located on the end of the sleeve remote from the rod, this blade having at least one hole leading to its surface which is in communication with the interior of a rod through the sleeve. The tool preferably has a flushing housing provided with ports leading from its interior to its exterior located between the sleeve and a rod.

3,824,647

DEVICE FOR GUIDING A FLAT PAINT BRUSH

Fritz Deck, Gellertstrasse 25, and Norbert Keim, Karl-Schurz-Strasse 40, both of Karlsruhe, Germany

Filed Dec. 27, 1972, Ser. No. 318,879
Int. Cl. A46b *17/00*; **B44d** *3/22*
U.S. Cl. 15—248 R **2 Claims**



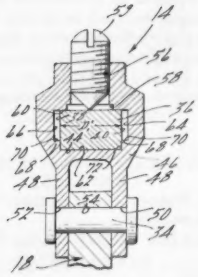
A flat paint brush is guided in a device which comprises a base plate and a guide plate pivotally mounted on the base plate for pivoting parallel to the brush plane. The base and guide plates are interconnected by a pivot pin. One end of the pivot pin is rectangular and frictionally engaged in a like opening in the guide plate while the other pivot pin is oval and frictionally engaged in a like oval slot portion in the base plate, which slot portion extends from the outer edge of the base plate, with an elongated slot portion extending upwardly therefrom. A cover plate larger than the pivot ends is mounted over each end.

3,824,648

WINDSHIELD WIPER ASSEMBLY

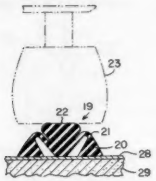
Johan H. van den Berg, and Alex H. A. Van Eekelen, both of Hasselt, Belgium, assignors to Monroe Belgium N.V., Sint-Truiden, Belgium

Filed Nov. 10, 1972, Ser. No. 305,529
Int. Cl. B60s *1/40*
U.S. Cl. 15—250.32 **1 Claim**



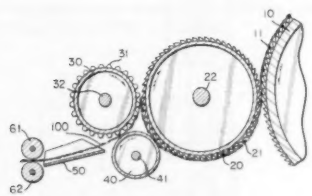
A connector for operatively securing a windshield wiper blade assembly to selected of associated wiper arms having different size connecting end portions thereon, the connector including a body having means thereon for attaching the same to the blade assembly and defining a cavity having means therein defining first and second size areas adapted to receive corresponding size connecting end portions of selected wiper arms.

3,824,649
DOOR BUMPER
Donald F. Kempf, 435 N. Lincoln St., Orange, Calif. 92666
Filed Dec. 4, 1972, Ser. No. 311,932
Int. Cl. F16f 1/36
U.S. Cl. 16—86 A 4 Claims



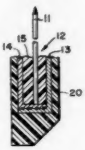
A wall mounted door knob bumper having a resilient cushioning member attached to a flexible adhesive carrying backing member such as a flexible sheet of plastic attached to and extending beyond the periphery of the cushioning member to form a decorative border. The cushioning member may be made in various cross-sectional configurations some of which are solid and some having apertures therein. The exposed portion of the backing member may be made in any number of different designs such as flowers, geometric patterns, or any other desired motif. The bumper is attached to a wall simply by peeling a protective cover off the adhesive backing and pressing the bumper in the desired location on a wall where it will be contacted by a doorknob.

3,824,650
APPARATUS AND PROCESS FOR TRANSFERRING A FIBER WEB
Moriichi Watanabe, Aichi, Japan, assignor to Nagoya Metallic Card Co., Ltd., Aichi-ken, Japan
Continuation of Ser. No. 755,182, Aug. 26, 1968, abandoned. This application Nov. 24, 1970, Ser. No. 92,500
Claims priority, application Japan, Apr. 19, 1968, 43-25822
Int. Cl. D01g 15/46, 15/50
U.S. Cl. 19—114 3 Claims



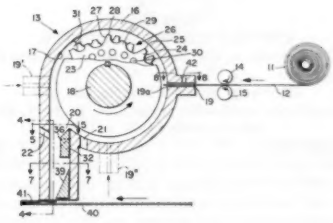
Apparatus and process for separating a web of fibers from a doffer in a carding machine whenever a roller comb is provided adjacent to the peripheral surface of a doffer, said roller comb being wound on its circumference with a metallic wire in the form of tooth defined by an outwardly projecting portion forming a roundish curve. The roller comb is rotated in the same direction as that of the doffer at a lower rate of surface speed than that of the doffer. A web roller having a smooth surface is located adjacent to both said doffer and said roller comb below a straight line connecting the center of the doffer and the axis of the roller comb. The web roller is rotated in the direction opposite to that of the doffer at a lower rate of surface speed than that of said roller comb thereby forming a space in the form of triangle by said three means of the doffer, the roller comb and the web roller comb.

3,824,651
FALLER BAR CONSTRUCTION
Howard G. Goff, 402 Shallow Ford, Chattanooga, Tenn. 37411
Continuation-in-part of Ser. No. 222,815, Feb. 2, 1972, abandoned. This application Feb. 23, 1973, Ser. No. 335,129
Int. Cl. D01g 19/10
U.S. Cl. 19—129 R 2 Claims



A faller bar for a textile combing machine comprising a pair of L-shaped reinforcing members extending substantially throughout the length of the bar and being spot welded or otherwise secured to one another to form a channel in which is disposed in spaced relationship a series of pins and retained in the channel by means of a plastic material extending therein. A pair of metal plates are provided at each end of the bar and are retained in their respective positions by means of a suitable plastic material extending thereover. The metal plates are secured to the channel forming members as by a line of weld in order to increase the rigidity of the bar.

3,824,652
APPARATUS FOR PREPARING AIRFELT
Kenneth B. Buell, Cincinnati, Ohio, assignor to The Proctor & Gamble Company, Cincinnati, Ohio
Division of Ser. No. 182,795, Sept. 22, 1971. This application June 22, 1973, Ser. No. 372,729
Int. Cl. D01g 25/00
U.S. Cl. 19—156.3 4 Claims

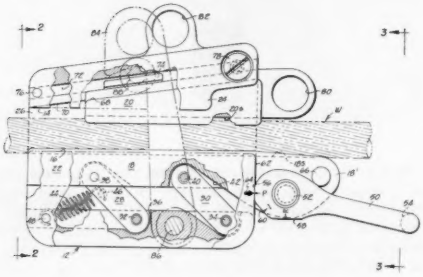


Apparatus and process for continuously converting dried cellulosic fibrous sheet material into a dispersion of individual fibers in air and thereafter forming said individual fibers into an airfelt.

3,824,653
WIRE GRIP
Robert L. Sholler, 1871 Shelley Dr., Santa Rosa, Calif. 95401
Filed June 13, 1973, Ser. No. 369,480
Int. Cl. B25b 25/00
U.S. Cl. 24—134 KB 5 Claims

A grip for wires and cables for use by linemen when applying tension to such wires and cables during installation thereof. The grip includes a rigid housing that defines a laterally accessible pathway for the wire. Wire engaging jaws are disposed on opposite sides of the pathway for movement toward the pathway so as to grip a wire residing therein. One

jaw is supported on a four bar linkage arrangement that maintains the jaw surface in parallelism with the pathway. Associated with such jaw is a bail to which tension is applied when pulling the wire so that the force on the wire is proportional to the tension applied to the bail. The other jaw is wedge shaped and the housing has a diverging bearing surface so that movement of the second jaw along the surface moves the wire



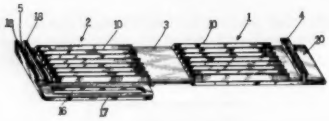
gripping portion of the second jaw into engagement with wire in the pathway. The second jaw is provided in a variety of sizes so that one grip can be used on a wide range of wire diameters. The mounting for the first jaw includes a spring for biasing the first jaw away from the wire pathway and a cam member for positioning the first jaw against the force of the spring so that the grip will remain on the wire in the absence of tension and until intentionally dislodged by movement of the cam.

3,824,654

CONNECTOR OR AN ADJUSTER

Teruo Takabayashi, Kyoto, Japan, assignor to Korin Limited, Kyoto, Japan

Filed Aug. 28, 1972, Ser. No. 284,255
Claims priority, application Japan, Dec. 27, 1971, 46-1518
Int. Cl. A44b *21/00, 11/00*
U.S. Cl. 24—198 **1 Claim**



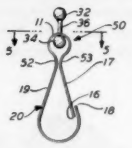
The present invention relates to a connector or an adjuster such as buckles, fasteners and the like comprising a first plate member, a second plate member, a pivotal member for connecting the plate members to each other and for governing the opening and closing movements of said plate members, and a locking means for immobilizing the closed condition of both plate members, and said members and means are molded integrally of plastic material.

3,824,655

SNAP HOOK

Marvin S. Hills, 125 Springfield Rd., Elizabeth, N.J. 07208

Filed Oct. 13, 1972, Ser. No. 298,714
Int. Cl. A44b *13/02*
U.S. Cl. 24—237 **1 Claim**



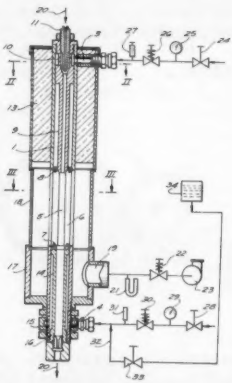
There is provided a novel Snap Hook of the type commonly known as lanyard hooks having a suspending means readily adaptible for use in key cases.

3,824,656

APPARATUS FOR CRIMPING OF FILAMENTARY MATERIALS

Ernst Bauch, Bordesholm, Germany, assignor to Neumunsterschi Maschinen-und Apparatebau Gesellschaft GmbH, Neumunster, Germany

Division of Ser. No. 214,238, Dec. 30, 1971. This application Feb. 2, 1973, Ser. No. 329,189
Int. Cl. D02g *1/20*
U.S. Cl. 28—1.3 **10 Claims**



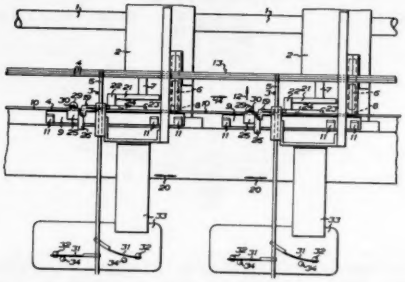
A crimping chamber is provided having an axially spaced inlet and outlet and intermediate the same radial venting ports. A filamentary material to be crimped is entrained and inserted into the inlet of the chamber with a stream of hot fluid which, upon entry into the chamber becomes vented through the venting ports. Into the chamber in the region of the outlet there is admitted in counterflow to the filamentary material a stream of cool gas which also subsequently vents through the outlet ports, and admitted into this stream of cool gas is a liquid to be finely dispersed therein.

3,824,657

GUIDING DEVICE IN A MACHINE FOR MANUFACTURING VENETIAN BLINDS

Stig Albert Nilsson, Foreningsgatan 38, 211 52 Malmo, Sweden

Filed Apr. 3, 1973, Ser. No. 347,595
Claims priority, application Sweden, Apr. 12, 1972, 4702/72
Int. Cl. B23p *19/04*
U.S. Cl. 29—24.5 8 Claims



In a machine for manufacturing Venetian blinds which consist of slats and ladder tapes carrying the slats and having longitudinal parts and transverse parts, each transverse part comprising a carrying element and a supporting element between which the slat for its insertion is moved in its longitudinal direction along a slat insertion path towards and through ladder tape positions, a guiding device is used at each ladder tape position for secure insertion of each slat between the carrying and supporting elements of each transverse part of the ladder tapes, said guiding device having a guide means which is movable in the longitudinal direction of the ladder tape, when the tape is stepwise moved in its longitudinal direction, and also movable towards and away from the ladder tape along the slat insertion path and which is provided with an operating means defining together with part of the guide means a groove for the supporting element and protruding forwardly from the guide means, counted in the direction of insertion of the guide means between the carrying element and the supporting element of the ladder tape.

ERRATUM

For Class 29—130 see:
Patent No. 3,825,412

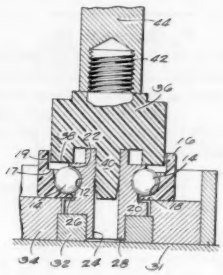
3,824,658

METHOD OF FABRICATING A BEARING ASSEMBLY

Jerome T. Donahue, Oconomowoc, Wis.; Walter F. Hess, Deerfield, Ill.; Gordon W. Knoebel, Madison, and Donald E. Sydow, Oconomowoc, both of Wis., assignors to Oconomowoc Mfg. Corp., Oconomowoc, Wis.

Filed Apr. 19, 1973, Ser. No. 352,838
Int. Cl. B23p *11/00*; F16c *33/00*
U.S. Cl. 29—148.4 A 5 Claims

A bearing and roller assembly having a unitary inner race which is grooved on its outer periphery to receive a plurality of bearing balls. A unitary, resilient outer race is dimensioned on its inner periphery to receive the bearing balls and to fit over the inner race with one axial end of the outer race being spaced from the corresponding axial end of the inner race by a distance which is smaller than the diameter of the bearing balls but large enough to permit the bearing balls to be forced therethrough. In assembling the bearing, the balls are positioned adjacent to the space between the axial ends of the inner and outer races and are forced by a hydraulically



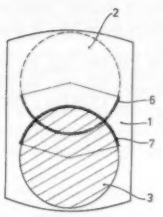
powered plunger into the space between the two races. The outer race deforms elastically as the balls are forced past its axial end and then snaps back to its original dimensions to hold the balls in place between the two races.

3,824,659

CRANKSHAFT WITH HARDENED TRANSITION PORTIONS AND ITS MANUFACTURE

Richard Sommer, Augsburg, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Augsburg, Germany

Filed Mar. 5, 1973, Ser. No. 338,131
Int. Cl. B21d *53/10*
U.S. Cl. 29—149.5 R 9 Claims



The crankshaft blank is first machined to provide oversize bearing pin thickness. Relief grooves provide transition fillets. Heat hardening is provided in a portion of these fillets, mainly in the portion of their periphery that falls within the longitudinal overlap of adjacent bearing pins. The bearing pins are then machined to design dimensions, parallelism and alignment, at the same time eliminating the effect of any warp arising from the hardening process.

3,824,660

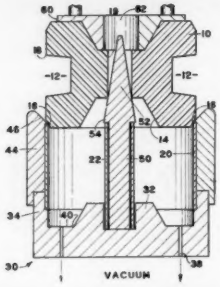
METHOD AND APPARATUS FOR VACUUM ASSEMBLING OF BUSHINGS

Jere L. Lowe, Logansport, Ind., assignor to The General Tire & Rubber Company, Akron, Ohio

Filed May 16, 1973, Ser. No. 357,152
Int. Cl. B21d *53/10*
U.S. Cl. 29—149.5 NM 9 Claims

A method and apparatus for assembling articles, especially bushings, of the type having a generally cylindrical or oval elastomeric insert, a rigid outer sleeve, and a rigid inner core. The sleeve and the core are positioned within the fixture of the present invention and the bottom portion of the insert is located within the top portion of the outer sleeve. The posi-

tioning of the parts is such that the outer sleeve, the insert, the inner core, and the apparatus define an included chamber which is substantially air-tight. A vacuum is then applied to the enclosed chamber and the resulting suction on the bottom



portion of the insert, together with any additional external force that may be required, cause the insert to move into assembled position, radially compressed, between the inner core and the outer sleeve.

3,824,661

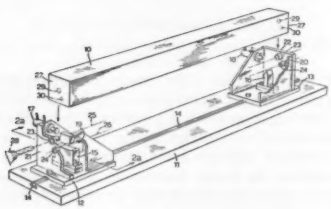
PROCESS FOR THE FABRICATION OF STRUCTURAL COLUMN MEMBERS

Richard N. Dobson, Village of Creemore, Ontario, and Gordon A. Webster, Town of Dundas, Ontario, both of Canada, assignors to Dominion Foundries & Steel Limited, Hamilton, Ontario, Canada

Division of Ser. No. 220,297, Jan. 24, 1972. This application Jan. 29, 1973, Ser. No. 327,347

Int. Cl. B23p *17/00*

U.S. Cl. 29—155 C **5 Claims**



In a process for the production of a structural column member of solid cross-section the member is rolled directly from a steel billet; the billet is mounted in suitable apparatus (an example of which is described in the specification) establishing a theoretical axis along the column and its ends are squared relative to this axis. One end is provided with two accurately-located pins which are a close fit in corresponding accurately-located holes in the adjacent end of an abutting member. The aligned pin and hole in the opposite ends of each member establish the said theoretical axis which is used for locating brackets etc. fastened to the column member, despite any deviations of the member from straight. This theoretical axis is also used in assembling the members in a structure incorporating them.

3,824,662

PROCESS FOR PRODUCING AN OIL SEAL TO BE APPLIED TO THE ROTARY PISTON ENGINE

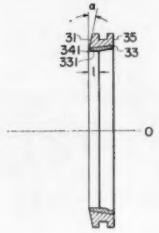
Hiroshi Minegishi, Kawagoe, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo and Toyo Kogyo Company, Hiroshima-ken, both of Japan

Filed Feb. 8, 1972, Ser. No. 224,551

Claims priority, application Japan, Feb. 8, 1971, 46-4739

Int. Cl. B23p *15/06*

U.S. Cl. 29—156.6 **3 Claims**



A process for producing an oil seal for use in a rotary piston engine, which comprises the steps of forming an inner peripheral surface of an oil seal base body into an angled circumferential surface with a solid angle of 2 θ from a sliding surface side of the body toward a rear surface side or into an indented circumferential surface, cutting out partly the inner peripheral surface on the rear surface side along the inner peripheral surface, plating a hard metal layer on the slant or indented inner circumferential surface, and then honing exclusively a partial zone of the hard layer surface on the sliding surface side.

3,824,663

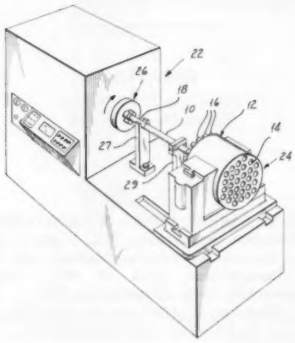
METHOD OF WELDING A TUBE TO A TUBE SHEET

Jesse Sohn, Newton, N.J., and Louis A. Gunther, Maspeth, N.Y., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Feb. 7, 1973, Ser. No. 330,312

Int. Cl. B23p *15/26*

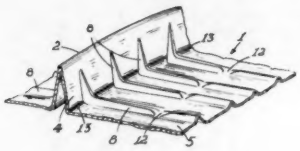
U.S. Cl. 29—157.4 **8 Claims**



The method welding of tubes to a tube sheet comprises butt welding an elongated bar to one end of a tube to be welded so that the bar is in substantial axial alignment with the tube and, thereafter, welding the opposite end of the tube to a tube sheet by friction or inertia welding using the bar to at least partially support the tube for movement relative to the tube sheet.

After the tube is welded to the tube sheet, the bar is cut a predetermined distance from the point of attachment of the bar to the tube to form a cap, if desired. The bar then may be worked to provide the cap with a desired configuration.

3,824,664
CLADDING SHEETS
Morris Seeff, 11 First Ave., Houghton, Johannesburg, Transvaal, South Africa
Continuation of Ser. No. 239,166, March 29, 1972, abandoned. This application Dec. 11, 1973, Ser. No. 423,764
Int. Cl. B21d *13/10*
U.S. Cl. 29—180 SS **16 Claims**

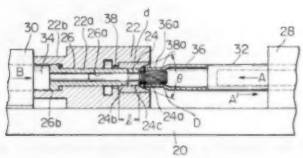


A method of bending a corrugated sheet about an axis extending at right angles to the corrugations is disclosed wherein a plurality of rib formations are pressed in those corrugations having their apices nearest the axis, the rib formations all projecting from the same surface of the sheet relative to the axis and extending at an angle to the corrugations over at least part of the side portions and at least part of the intermediate portions of the corrugations.

In one form of the invention the corrugated sheet comprises a metal cladding sheet.

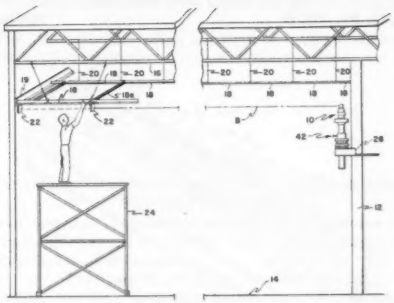
Also disclosed is a corrugated sheet bent about an axis extending at right angles to the corrugations including a plurality of rib formations projecting from the same surface of the sheet when viewed from the axis, the rib formations being at an angle to the corrugations and extending over at least part of the side portions and at least part of the intermediate portions of the corrugations.

3,824,665
APPARATUS FOR PRODUCING AN ASSEMBLY OF A METAL TUBING AND SERRATED ROD
Shigeru Saito, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan
Filed Oct. 13, 1972, Ser. No. 297,335
Claims priority, application Japan, Oct. 14, 1971, 46-80557
Int. Cl. B23p *19/00*
U.S. Cl. 29—200 B **8 Claims**



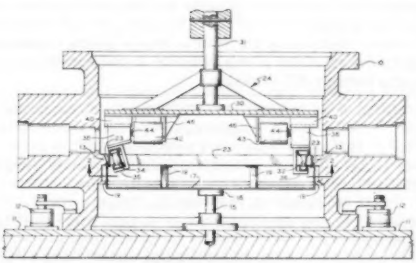
Herein disclosed are an improved method and apparatus for manufacturing an assembly of a hollow metal tubing and a rod having a serrated portion which is closely inserted into a reduced end portion of the tubing which has an inside diameter substantially larger than an outside diameter of the serrated portion of the rod. The rod is first loosely inserted through its serrated portion into the tubing and thereafter the reduced end portion of the tubing is radially squeezed by a swaging process so that the reduced end portion of the tubing is deformed under radial compression and closely fitted onto the serrated portion of the rod with an excess of wall of the reduced end flown into the grooves between the individual serrations of the rod. The assembly thus produced is specifically adapted to constitute a collapsible type steering column assembly which is used for the protection of a driver of a motor vehicle during a frontal collision.

3,824,666
APPARATUS FOR INSTALLING CEILINGS
Roger J. Roodvoets, Grand Rapids, and Edward G. Nielsen, Wyoming, both of Mich., assignors to Laser Alignment, Inc., Grand Rapids, Mich.
Division of Ser. No. 152,298, June 11, 1971. This application Jan. 2, 1973, Ser. No. 320,259
Int. Cl. B23p *19/00;* **B23q** *17/00*
U.S. Cl. 29—200 P **13 Claims**



A device which emits a rotating beam of collimated light, preferably a laser source assembly, is mounted at a level which has a predetermined relationship to the level desired for a suspended ceiling. A target is placed on a ceiling panel supporting member and the member is elevated until the target is intercepted by the light beam at a predetermined line on the target. At this point, the ceiling supporting member is fixed in place. When it is desirable to bend the supporting wires before the ceiling supporting members are installed, the target may be moved along adjacent the wire and the wire bent at a given distance from the point where the light beam intercepts the target.

3,824,667
HYDRAULIC VALVE SEAT EXPANDER
Joseph W. Smith, and Eugene A. Hollencamp, both of Dayton, Ohio, assignors to Carrier Corporation, Syracuse, N.Y.
Filed June 5, 1973, Ser. No. 367,259
Int. Cl. B23p *19/00*
U.S. Cl. 29—200 B **5 Claims**



A valve seat liner ring formed of relatively thin material is positioned in a valve body in registration with a valve seat. The

valve body is rotated. A circular series of liner ring expanding and forming rolls are carried by a support plate and moved in the valve with the rolls in registration with the liner ring. A roll mover is connected to each roll. The roll movers are operable when actuated to move the rolls radially outward into engagement with the liner ring to expand the same against the seat and form the liner ring in close engagement with the seat. The roll movers are preferably in the form of fluid operated piston and cylinder structures.

3,824,668

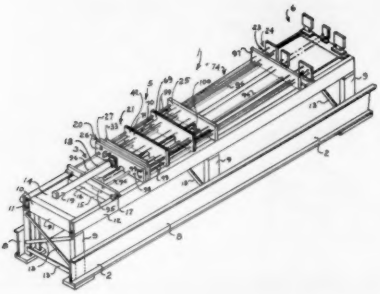
CONTINUOUS STROKE TUBE INSERTION AND EXPANDING DEVICE

Lawrance W. Wightman, St. Louis, Mo., assignor to Emerson Electric Co., St Louis, Mo.

Filed Jan. 26, 1973, Ser. No. 327,244

Int. Cl. B23p *15/26*; B23q *7/10*

U.S. Cl. 29—202 D **25 Claims**



A continuous stroke tube insertion and expanding device is provided for automatic and continuous tube insertion and expansion, useful in the manufacture of electronic air filter cells. The apparatus of this invention includes a tube magazine and a plurality of pusher rods which travel longitudinally of the apparatus, engaging the ends of a plurality of metal tubes during travel. The pusher rods have expanding means attached at their ends which engage the tubes. The pusher rods and expanding means drive the tubes through the plates of a cell assembly for an electronic air filter cell until the leading ends of the tubes engage a stop at one end of the apparatus. Tube stop engagement prevents further tube travel. However, pusher rod movement continues, driving the expanding means through the tubes in one continuous operation. Expansion of the tubes combines the tubes and plates into an integral unit. After the tube expanding means has joined a predetermined number of tubes and plates, the tube stop is removed. Tube expansion thereafter is accomplished with the tubes being held only by the expansion joint made between tubes and plates previously combined in the expansion process. Because tube expansion is progressing toward the free end of the tubes, the tubes remain in tension. Maintaining the tubes in tension during expansion enables the apparatus of this invention to prevent undesireable tube bending and distortion.

3,824,669

HAND-OPERATED CRIMPING TOOL

John Leslie Hilton, Ringwood, England, assignor to Plessey Handel Und Investments A.G., Zug, Switzerland

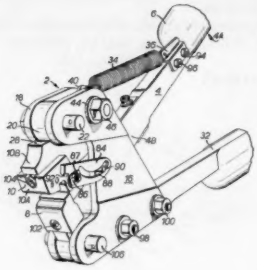
Filed Mar. 8, 1973, Ser. No. 339,462

Claims priority, application Great Britain, Mar. 9, 1972, 11163/72

Int. Cl. H01r *43/04*

U.S. Cl. 29—203 HT **6 Claims**

A hand-operated crimping tool which comprises two handles; a crimping arrangement positioned on one and including a fixed crimping die and a movable crimping die; spring biasing means such as a leaf spring biasing the movable die away from the fixed die and a rotatable cam for rolling over a surface of the movable die; the cam and the said surface of the movable die being so shaped relatively to each other that depression of the said one handle causes the cam to roll over



the surface and move the movable die from an open position in which the two dies are spaced apart to allow insertion of a device to be crimped, to a crimping position in which the two dies effect a desired crimping of the device, and then to a release position in which the two dies are spaced apart to allow removal of the crimped device. Swinging cutters on either side of the movable die are preferred.

3,824,670

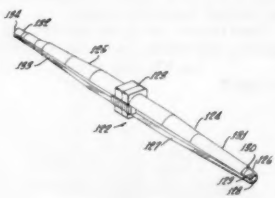
CONTACT INSERTION AND REMOVAL TOOL

Kenneth M. Clark, Beaumont, Calif., assignor to The Deutsch Company Electronic Components Division, Banning, Calif.

Division of Ser. No. 167,317, July 29, 1971, Pat. No. 3,727,172, which is a continuation-in-part of Ser. No. 83,782, Oct. 26, 1970, abandoned. This application Apr. 4, 1973, Ser. No. 347,849

Int. Cl. H01r *43/00*

U.S. Cl. 29—203 H **7 Claims**



A tool for installing and removing contacts in an electrical connector that includes an insert having continuous openings between the forward and rearward ends, each of the openings receiving a contact which is retained between a rearwardly facing shoulder in each opening and integral resilient fingers on the insert, which incline forwardly and inwardly from the circumferential wall of the opening to engage the rearward contact shoulder. The openings for the contacts include tapering surfaces which contract the longitudinally split insertion and removal tool so that it can enter a smaller portion of the opening adjacent the spring fingers as the contact is installed and removed, allowing the tool to be more readily manufactured in smaller sizes with a relatively wide longitudinal slot.

3,824,671

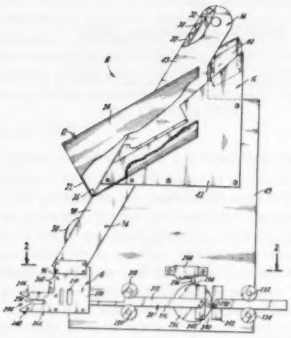
APPARATUS FOR CLIPPING FOLDED ARTICLES OF CLOTHING AND THE LIKE

Theodore Watkin, Stamford, Conn., assignor to Theodore Watkin; Maurice W. Friedman, both of Long Island and Alfred S. Friedman, Woodmere, Long Island, all of, N.Y.

Continuation of Ser. No. 158,772, July 1, 1971, Pat. No. 3,740,823, and a continuation-in-part of Ser. No. 53,409, July 9, 1970, abandoned. This application Nov. 21, 1972, Ser. No. 308,317

Int. Cl. B23q 7/10

U.S. Cl. 29—211 R 16 Claims



An apparatus is provided for placing spring clips over the edges of folded articles and the like in an automated manner. The apparatus generally includes a slide for properly orienting the clips and loading them into a supply chute, a drive for taking the clips one at a time from the supply chute and transporting each clip toward and over the edge of the folded article and a ramp cooperating with the drive, for opening the mouth of each clip as the clip approaches the edge of the folded article and then releasing the clip mouth when the clip is properly positioned over said edge.

3,824,672

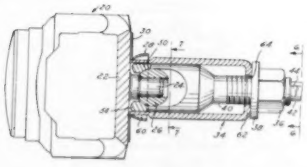
BALL STUD REMOVER

Jacob Michelsen, Aabenraa, Denmark, assignor to Kent-Moore Corporation, Warren, Mich.

Filed Apr. 5, 1973, Ser. No. 348,337

Int. Cl. B23p 19/02

U.S. Cl. 29—263 4 Claims



A ball stud removing tool for removing a ball from a stud on which it is press-fitted, wherein a cup-shaped shield surrounds the stud adjacent the ball; comprising a first member having an externally threaded upper end and a yoke-shaped lower end, the free ends of the yoke being dimensioned to embraceably engage the ball below its diameter so that it may be pulled from the stud. A second sleeve-like member is received over the first member after assembly of the latter on the ball, its threaded portion extending through an aperture in the upper sleeve end. An internally threaded nut is then threaded onto the first member, which is thereby retracted into the sleeve, drawing the ball from the stud.

3,824,673

METHOD OF TRANSPORTING AND PROCESSING IRRADIATED FUEL ELEMENTS

Joseph G. Wurm, Boeretang, and Paul R. Heylen, Lijsterdreef, both of Belgium, assignors to European Atomic Energy Community (Euratom), European Center Kirchberg, Luxembourg

Filed July 11, 1972, Ser. No. 270,839

Claims priority, application Netherlands, Aug. 4, 1971, 7110751

Int. Cl. B23p 7/00; G21f 9/00

U.S. Cl. 29—403 5 Claims

A method for the treatment of irradiated fuel elements of the type consisting of a can containing one or more fissile fuel rods. The space between the fuel rods and the can is filled with an alloy having a melting point of at least 700°C and the alloy is allowed to solidify. The alloy usually has good thermal conductivity.

The method is particularly useful when irradiated fuel elements are to be transported to a processing factory.

3,824,674

AUTOMATIC ASSEMBLY CONTROL METHOD AND DEVICE THEREFOR

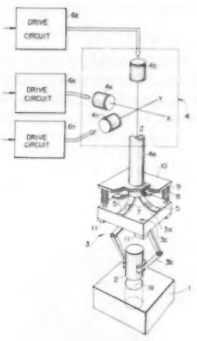
Tadao Inoyama, Yokohama; Tatsuo Goto, Nishitama, and Kiyoo Takeyasu, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed July 19, 1973, Ser. No. 380,558

Claims priority, application Japan, Jan. 29, 1973, 48-11086; Jan. 31, 1973, 48-11954; Mar. 7, 1973, 48-26114; July 19, 1972, 47-71659; Dec. 1, 1972, 47-119820

Int. Cl. B23q 17/00

U.S. Cl. 29—407 21 Claims

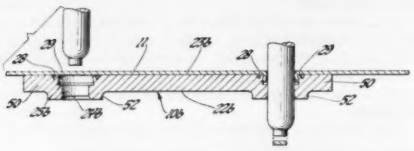


An automatic assembly control device employs a holding mechanism for holding a piston coupled to a positioning mechanism through elastic coupling means, so that the positioning mechanism may be controlled in response to signals representative of the displacement or deflection of the elastic coupling means. The piston is first placed upon the external part out of a range of variation in position of the center of a cylinder into which is fitted the piston, and then moved toward the center while the piston is pressed against the external part with a predetermined pressure. The completion of the above coarse positioning or adjustment is detected by detecting the partial insertion of the piston into the cylinder, and then the piston is gradually inserted into the cylinder while its position is corrected by the positioning mechanism.

3,824,675
METHOD OF MAKING EXTRUDED PANEL AND NUT ASSEMBLY

David B. Ballantyne, Southfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 154,084, June 17, 1971, abandoned. This application Mar. 14, 1973, Ser. No. 341,110
Int. Cl. B23p 9/00
U.S. Cl. 29—445 1 Claim

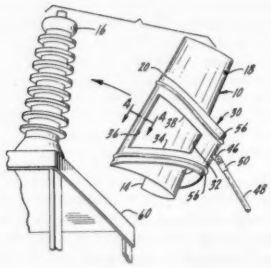


A panel extruding nut for use with a thread forming screw and adapted to be mechanically secured to a flat sheet basal member, the nut including a body having opposed flat surfaces and opposed coaxial first and second bores, the first bore having a diameter slightly larger than the minor diameter of the screw thread, the second bore having a diameter which, together with two extruded or drawn thicknesses of the basal member, is substantially equal to the diameter of the first bore. A punch is used to pierce the basal member and to extrude and shape an integral neck into the second bore which mechanically secures the panel extruding nut. The neck and the panel extruding nut are then threaded by the thread forming screw.

3,824,676
METHOD OF APPLYING A REMOVABLE COVER TO AN ELECTRICAL INSULATOR BUSHING

Lloyd A. Ebert, 2349 Meadow Ln., Green Bay, Wis. 54301

Filed Nov. 15, 1972, Ser. No. 306,710
Int. Cl. H01b
U.S. Cl. 29—450 2 Claims

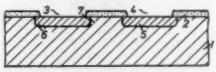


A bushing cover with an application tool and the method of employing them to cover bushings in a multi-KV high voltage electrical system so as to allow painting, sandblasting and other maintenance operations of the system to be performed without shutting off the power to the system, damaging the bushings, or endangering workmen.

3,824,677
METHOD OF MANUFACTURING A FIELD EFFECT TRANSISTOR

Werner Scherber, Heilbronn, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Division of Ser. No. 206,635, Dec. 10, 1971, Pat. No. 3,791,023. This application July 23, 1973, Ser. No. 381,507
Claims priority, application Germany, Dec. 21, 1970, 2062810
Int. Cl. B01j 17/00
U.S. Cl. 29—571 1 Claim

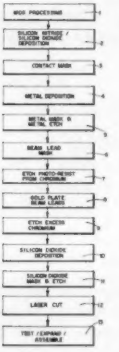


A method of manufacturing a field effect transistor comprises forming a nitride layer on the surface of a semiconductor body of a first type of conductivity containing two spaced regions of a second type of conductivity; forming an oxide layer on the nitride layer; forming windows in the nitride and oxide layers extending to the surface of the semiconductor body above the two regions of the second type of conductivity and above the zone between the two regions; forming a thin oxide layer in the window above the zone between the two regions; forming a gate electrode in the window above the zone between the two regions and forming contacts in the windows above the two regions.

3,824,678
PROCESS FOR LASER SCRIBING BEAM LEAD SEMICONDUCTOR WAFERS

Ronald E. Harris, Placentia, and Darrel F. Cullen, Costa Mesa, both of Calif., assignors to North American Rockwell Corporation, El Segundo, Calif.

Continuation of Ser. No. 68,283, Aug. 31, 1970, abandoned. This application Oct. 25, 1972, Ser. No. 300,548
Int. Cl. B01j 17/00
U.S. Cl. 29—578 10 Claims



Microelectronic circuits are produced in semiconductor wafers with beam leads having adhering and non-adhering portions. The non-adhering portions comprise the projecting part of the beam lead. The wafer is divided into chips having beam leads by partially cutting the wafer from the reverse side

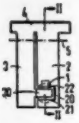
with a laser beam. The wafer is initially positioned for the laser cutting using an infrared light and a vacuum for securing the wafer at the correct position prior to the laser scribing. The uncut portion of the wafer is broken and the semiconductor chips are separated. During the separation, the non-adhering portions of the beam leads become separated from adjacent chips.

3,824,679

METHOD OF MAKING SEMICONDUCTOR COMPONENT WITH SHEET METAL CONNECTOR LEADS

Willi Mosch, Munich; Gerhard Lutz, Erlangen, and Heinz Martin, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Berlin, Germany

Division of Ser. No. 18,797, March 16, 1970, abandoned, which is a continuation of Ser. No. 719,193, April 5, 1968, abandoned. This application Oct. 13, 1970, Ser. No. 80,465
Claims priority, application Germany, Apr. 8, 1967, 109258
Int. Cl. B01j *17/00*
U.S. Cl. 29—588 **2 Claims**



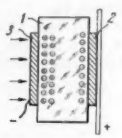
A semiconductor p-n junction device having a monocrystalline body, preferably of silicon, is equipped with connector leads which are punched out of sheet material and are soldered to the electrodes of the device. Each connector lead has at least one springy clamping lug protruding toward the other connector lead and located beside a clamping lug of another connector lead. The semiconductor body is clamped between the lugs of two adjacent connector leads and is soldered thereto.

3,824,680

NUCLEAR RADIATION DETECTOR AND METHOD OF MANUFACTURING SAME

Stanislav Fedorovich Kozlov, and Elena Laexandrovna Konorova, both of Moscow, U.S.S.R., assignors to Ordena Levina Fizichesky Institut Imeni P. N. Lebedeva, Leninsky Prospekt, Moscow, U.S.S.R.

Division of Ser. No. 716,953, March 28, 1968, Pat. No. 3,665,193. This application July 8, 1971, Ser. No. 160,917
Int. Cl. G01t *1/24*
U.S. Cl. 29—592 **11 Claims**



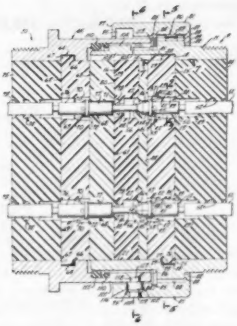
A method of manufacturing a nuclear radiation detector comprising forming a plate from a diamond crystal whose thickness does not exceed the distance travelled by charge carriers within the plate under the influence of an applied field. The plate is then annealed in a vacuum at a temperature of 1,000° to 1,300°C whereafter blocking and injecting contacts are formed on opposite sides of the plate. During operation of the detector, polarization within the plate is removed by injection of charge carriers into the plate via the injecting contact, the latter being formed on the side of the plate opposite to that which is subjected to the radiation to be detected.

3,824,681

METHOD OF PROVIDING A COUPLING FOR ELECTRICAL CONNECTORS OR THE LIKE

Kenneth M. Clark, Beaumont, Calif., assignor to The Deutsch Company Electronic Components Division, Banning, Calif.

Division of Ser. No. 167,317, July 29, 1971, Pat. No. 3,727,172, Continuation-in-part of Ser. No. 83,782, Oct. 26, 1970, abandoned. This application Apr. 4, 1973, Ser. No. 347,848
Int. Cl. H01r *23/60*
U.S. Cl. 29—593 **5 Claims**



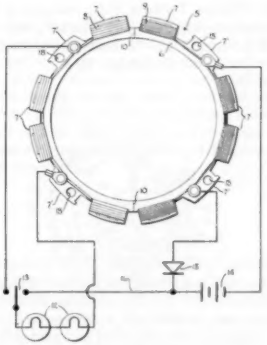
A coupling ring is made rotatable around but axially fixed relative to the plug shell of a connector, and provided with bayonet grooves for receiving pins on the receptacle, the bayonet grooves being given inner portions that fall within a radial plane without forwardly inclined recesses at their inner ends. Selective installation of spacer washers of various thicknesses for the coupling ring, and bayonet pins of different diameters, enable the coupling to properly position the plug relative to the receptacle irrespective of manufacturing tolerances.

3,824,682

METHOD OF MASS PRODUCING ALTERNATOR STATORS FOR SMALL ENGINES

Paul A. Tharman, Milwaukee, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed July 26, 1973, Ser. No. 382,700
Int. Cl. H02k *15/02*
U.S. Cl. 29—596 **2 Claims**



A plurality of stator core rings are produced, each having circumferentially spaced pole teeth arranged symmetrically to

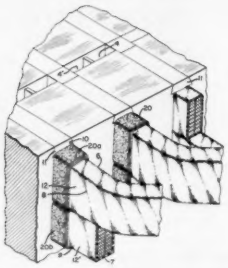
a diametral plane. Certain of the rings are wound with two like sets of windings of wire of one gage, each set confined to its own side of said plane. The remaining rings are similarly wound, but with wire of a different gage. Every ring is then severed on its said diametral plane, thus forming stator elements of two kinds that can be assembled to engines singly or in pairs, as needed.

3,824,683

METHOD FOR REDUCING CORONA IN A DYNAMOELECTRIC MACHINE

Ralph Gene Rhudy, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 13, 1973, Ser. No. 388,009
Int. Cl. H02k *15/02*
U.S. Cl. 29—596 **9 Claims**



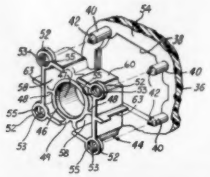
A method of reducing corona in a dynamoelectric machine is provided wherein electrically conductive paint is applied to the sides of stator winding bars and the sides of stator slots in contact therewith while the conductor bars are operably mounted within the stator slots. In addition, electrically conductive paths are formed between pre-selected portions of the conductor bars and the magnetic stator punchings adjacent thereto by positioning bodies of electrically conductive silicone rubber between each of the selected points on the conductor bars and the adjacent stator punchings. Means are provided for efficiently positioning the bodies of silicone rubber in operating position and then curing the rubber to assure its stability.

3,824,684

METHOD OF ASSEMBLING AN ELECTRIC MOTOR DEVICE AND HEAT SINK

Dale Kenneth Wheeler, Tarboro, N.C., assignor to The Black & Decker Manufacturing Company, Towson, Md.

Filed Aug. 27, 1973, Ser. No. 391,812
Int. Cl. H02k *15/14*
U.S. Cl. 29—596 **6 Claims**



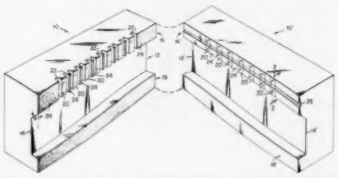
An electric motor housing and heat sink, and the method of assembling the same, in which a housing, constructed of electrically insulating material subject to thermal distortion, includes integral means for orienting and securing a metal heat sink therein, the latter having passages through which cooling air is drawn. The orienting means comprises deformable or meltable means such as pins integral with the housing and adapted to extend through apertures in the heat sink. The method includes assembling and retaining the heat sink into an operative integral position in the housing by deforming, for example, melting the interfitted housing pins into retaining relation against the heat sink. In addition, a shaft bearing may either be preassembled in the heat sink before assembly to the housing, or the heat sink bored and the bearing inserted therein after the heat sink is assembled to the housing.

3,824,685

METHOD OF MAKING A FERRITE HEAD

Nathan L. Burch, Los Angeles, and Leonard G. Tapia, Baldwin Park, both of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed Feb. 14, 1972, Ser. No. 225,898
Int. Cl. G11b *5/42*
U.S. Cl. 29—603 **23 Claims**



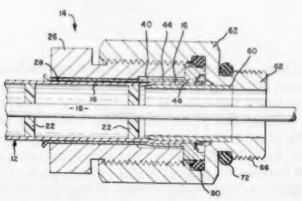
In a method of manufacturing a ferrite magnetic head, a thin layer of glass is sputtered onto one or more discrete portions of a planar surface of each of two ferrite members, at least one of the glass layers extending out of a gap defined when the two members are positioned with their respective planar surfaces in confronting relation. A layer of refractory material is deposited on other portions of the ferrite surfaces, to a thickness equal to the desired gap length, to serve as a spacer when the two members are so positioned. A quantity of glass is placed adjacent the gap and in contact with at least one of the sputtered glass layers, and the assembly is heated to soften the glass layers and the quantity of glass; the quantity of glass is drawn into the remaining portion of the gap apparently in response to a reduced resistance to capillary flow provided by the softened glass layers within the gap.

3,824,686

A METHOD OF TERMINATING A SEMI-RIGID COAXIAL CABLE

Edgar Wilmot Forney, Jr., Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 252,791, May 12, 1972. This application Aug. 24, 1973, Ser. No. 391,393
Int. Cl. H05k *43/00*
U.S. Cl. 29—628 **4 Claims**



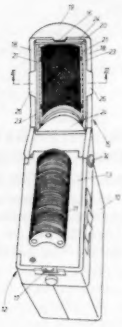
This invention relates to a coaxial cable connector featuring inner and outer ferrules between which the outer conductor of

a semi-rigid cable is squeezed. The assembly of the connector onto the cable is accomplished with ordinary standard hand wrenches operating on an outer coupling containing the outer ferrule nut threadedly engaging a connector body containing the inner ferrule. The structure of the connector preserves the critical diameters of the coaxial cable thereby reducing or eliminating reflective loss of radio frequency energy.

3,824,687
DRY SHAVER

Kurt Baumann, Solingen, Germany, assignor to Robert Krups, Solingen-Wald, Germany

Filed Jan. 26, 1973, Ser. No. 326,865
Claims priority, application Germany, Jan. 28, 1972, 2203926
Int. Cl. B26b *19/04*
U.S. Cl. 30—43.92 **16 Claims**

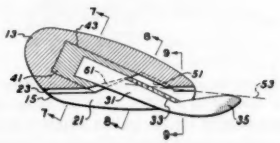


A shear head is provided on a housing of a dry shaver and a replaceable unit can be releasably connected with the shear head so that it can be replaced in toto. The unit comprises a frame and an apertured shear foil which is mounted in the frame in curved operating condition and can be inserted into and removed from the shear head together with the frame.

3,824,688
ENVELOPE OPENER

William L. Goffe, 301 Burnett Rd., Webster, N.Y. 14580

Filed May 30, 1973, Ser. No. 365,075
Int. Cl. B26b *29/00*
U.S. Cl. 30—294 **16 Claims**

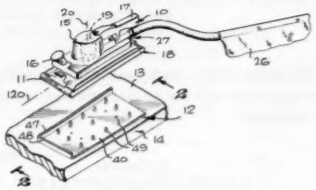


An envelope opener having a small body to be manually grasped, with a groove along one edge of the body, sufficiently wide to receive an edge of an envelope to be opened. An oblique knife blade lies entirely within the groove, and a small guiding member projects forwardly from the forward end of the knife blade, to a visible position beyond the edge of the body, so that the guiding member may be inserted between the envelope flap and the rear wall of the envelope, at one corner of the envelope, to guide the top fold or crease of the envelope into the groove, whereupon the knife blade will cut the top fold when the top edge of the envelope is slid along the groove.

3,824,689
PIERCING OF AIR SUCTION HOLES IN ABRASIVE SHEET MATERIAL

Alma A. Hutchins, 49 North Lotus Ave., Pasadena, Calif. 91107

Division of Ser. No. 282,155, Aug. 21, 1972, Pat. No. 3,788,011. This application July 16, 1973, Ser. No. 379,341
Int. Cl. B26f *1/24*
U.S. Cl. 30—368 **3 Claims**

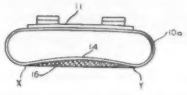


Apparatus including a portable sander having a power driven shoe adapted to carry a sheet of sandpaper or the like and containing suction holes through which air and abraded particles are drawn by suction to a collection bag, and a coacting piercing tool adapted to punch suction holes in a sheet of sandpaper carried by the shoe when the sander and piercing tool are moved relatively toward one another.

3,824,690
DENTAL BRACE BAND FOR UPPER INCISOR TEETH

Herbert L. Ruff, 2058 Genesee St., Utica, N.Y. 13502

Filed June 20, 1973, Ser. No. 371,776
Int. Cl. A61c *7/00*
U.S. Cl. 32—14 A **4 Claims**



An orthodontic band for the upper incisor teeth which have a concavely curved lingual surface has its lingual aspect thickened to prevent this aspect from being pulled away from the tooth by tension on the band for securing it around the tooth. The thickening is done with provision for forming a convexly curved portion closely conforming to the concavely curved lingual surface of the tooth to prevent an enlarged cement filled space between band and tooth to minimize cement washout from this space.

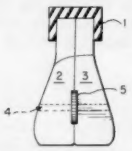
3,824,691
ADJUSTABLE SPLIT ARTIFICIAL TOOTH WITH MICROMETER WHEEL MEANS FOR DYNAMICALLY ADJUSTING THE MESIO-DISTAL TOOTH DIMENSION

Raul Acevedo, Arzuaga No. 9, Rio Piedras, San Juan, P.R.

Filed Nov. 6, 1973, Ser. No. 413,215
Int. Cl. A61c *19/00*
U.S. Cl. 32—71 **1 Claim**

An adjustable split artificial tooth comprising a micrometric wheel on a threaded rod which separates the tooth halves per-

mits very precise dynamic adjustments of the mesio-distal tooth dimension while an elastomer sleeve holds the tooth halves at the top in tight mating relation. This dynamic metri-



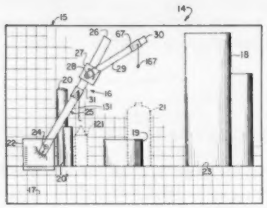
cally adjustable tooth is highly useful for illustrating tooth conditions to patients and can be used as a study model for educational purposes.

3,824,692

LIFT PLANNING APPARATUS

John W. Guffey, 306 Headlee Bldg., Odessa, Tex. 79761, and Richard D. Gillham, Box 2192, Odessa, Tex. 79760

Filed Oct. 2, 1972, Ser. No. 294,357
Int. Cl. B43l 7/06
U.S. Cl. 33—1 AA **7 Claims**



Lift planning apparatus for computing the required length, angular position, and free capacity of the boom of a crane apparatus, especially where the apparatus must work in a confined space.

The apparatus of the invention includes a base scale calibrated into predetermined horizontal and vertical units related to distance; a protractor indicative of a crane; and a replica of a boom and a point section.

The replica of the protractor, boom, and point section are arranged relative to the base scale so that various objects located within the area in which the actual crane is to work can likewise be scaled and placed onto the base scale thereby enabling one to ascertain by computation the optimum length and angular displacement of the boom.

The apparatus further includes a replica of a jib having a point section slidably received thereon, with the jib being journaled to a second protractor, and with the second protractor being slidably captured along the replica of the boom, thereby enabling the optimum boom length and angular displacement, the optimum jib length and angular displacement, and the free lifting capacity at either of the point sections to be calculated.

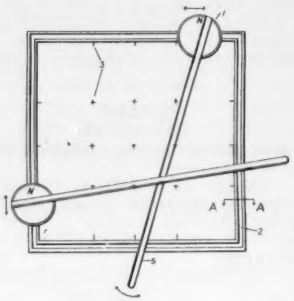
3,824,693

NAVIGATIONAL DEVICES

Kenneth Floyd Cherry, 1533 Eastgate St., Toledo, Ohio 43614

Filed Feb. 26, 1973, Ser. No. 335,583
Int. Cl. B43l 7/06, 13/08
U.S. Cl. 33—76 R **1 Claim**

The multi-arm navigational device is an improvement in navigational chart instruments. Movable arm protractors fitted in tracks and placed over the chart eliminate some operations in alignment and/or drawing in common naviga-



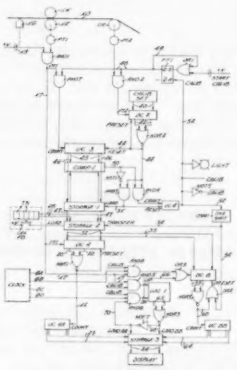
tional problems, thereby resulting in a decrease of time and effort in solving the problems.

3,824,694

LENGTH MEASURING SYSTEM HAVING AUTOMATIC UPDATE OF ROLL DIAMETER COMPENSATION VALUE

Lawrence M. Lesperance, West Allis; Hugh S. Drewry, and Gunars Vegners, both of Wauwatosa, all of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jan. 17, 1973, Ser. No. 324,345
Int. Cl. G06m 7/00; G01b 7/04
U.S. Cl. 33—141 R **34 Claims**



A strip length measuring system has a pulse tachometer driven by a measuring roll engaging the strip, a presettable footage downcounter for the pulses which is preset to a roll diameter compensation factor "calibration" count representing one foot of strip held in a storage register and counts backward to zero and is reset, and a total length counter which is incremented each time the footage counter is reset. The calibration constant count is automatically determined and updated to compensate for changes in measuring roll diameter by engaging the strip with a calibration roll of accurately known diameter, accurately measuring one foot of strip by counting the pulses from a pulse tachometer driven by the calibration roll when the strip is at running speed so no slippage can occur, in a downcounter preset to a calibration setpoint count representing one foot of movement of the circumference of the calibration roll, accumulating the pulses from the measuring roll tachometer in a measuring roll upcounter

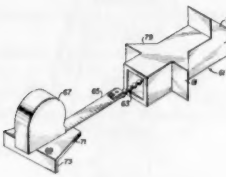
while the calibration roll downcounter is counting backward to zero to measure one foot of strip, and transferring the count accumulated in the measuring roll upcounter during movement of one foot of strip to the storage register so that the footage counter is preset to the updated roll diameter compensation factor calibration count.

3,824,695

MULTIPLE GAUGING DEVICE

Alexander W. McClay, Jr., 1679 Brandon Ave., Petersburg, Va. 23803

Filed July 10, 1970, Ser. No. 53,951
Int. Cl. G01b *3/10*
U.S. Cl. 33—137 R **10 Claims**



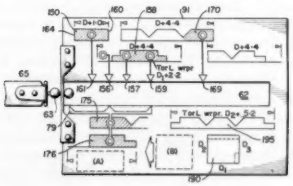
For use in laying out duct or box-like structures, a gauging device having multiple sides, including appendages in predetermined positions, with rotatable connection means for attaching the gauge to a measuring tape (or it can be integral with a measuring bar), with the appendages serving to position the tape or the bar so as to add various predetermined lengths to the tape or bar equivalent to material lapped or cut away in the fabrication of corner and lap joints or seams with the measuring tape or bar indicating directly in terms of the specified or finished inside dimensions of the structure. The appendages are configurated to enable measuring from points on each of several variously oriented planes.

3,824,696

MULTIPLE GAUGING DEVICE

Alexander W. McClay, Jr., 1679 Brandon Ave., Petersburg, Va. 23803

Filed Sept. 8, 1971, Ser. No. 178,750
Int. Cl. G01b *3/10*
U.S. Cl. 33—137 R **2 Claims**



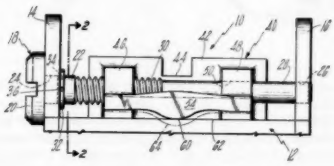
For use in laying out duct or box like structures, a gauging device in the form of a plate, with a slot, of appreciable width, lying preferably along the longitudinal centerline thereof, including spanning brackets and locating marks in predetermined positions, with rotatable connection means for attaching the gauge to a measuring tape (or it may be integral with a measuring bar), with the spanning brackets and locating marks serving to position the tape or bar so as to add several predetermined lengths to the tape or bar equivalent to the material lapped or cut away in the fabrication of corner or lap joints or seams with the tape or bar indicating directly in terms of the specified, or finished, inside dimensions of the structure. The spanning brackets are designed to enable the user to position the gauge over a point within or defining a groove by positioning the gauge directly over the intersection, or intersections, of a depending plane and the upper surface of the material being fabricated.

3,824,697

SIGHT ASSEMBLY

Henry A. Into, Farmington, Conn., assignor to Colt Industries Operating Corp., Hartford, Conn.

Filed Aug. 10, 1972, Ser. No. 233,482
Int. Cl. F41g *1/10, 1/26*
U.S. Cl. 33—252 **7 Claims**



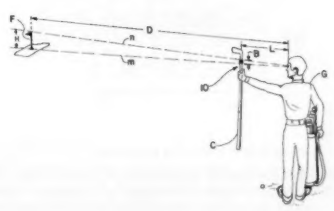
A one-piece resilient sight movable for windage adjustment along the axis of a screw mounted on a firearm wherein the sight has spaced bearing abutment portions on opposite diametrical sides of the screw and is stressed when assembled to urge the bearing abutment portions into engagement with the firearm for taking up manufacturing variations and tolerances and positively retaining the sight by the resiliency of its own material in a selected adjusted position.

3,824,698

GOLF-CLUB SELECTION AID

William S. Brucker, 1500 Providence Rd., Towson, Md. 21204

Filed Aug. 2, 1972, Ser. No. 277,144
Int. Cl. G01c *3/00*
U.S. Cl. 33—277 **7 Claims**



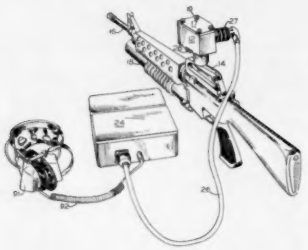
A mathematically proportioned sequentially related, color-identified set of markers for use in training as integral parts of respective golf clubs of a set and adapted to indicate correct club selection; the golfer makes a "one-time" calibration with regard to his own characteristics and to characteristic flagstick height on the course played to determine which color he should use of a sequence displayed on each device of the set, and after that selects all his clubs with reference to that single color.

3,824,699

AIMING DEVICE FOR INDIRECT FIRE GUNS

Ludwig J. Lenz, Muscatine, and Robert Stanley Thompson, Bennett, both of Iowa, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 19, 1972, Ser. No. 264,213
Int. Cl. G01c 9/34; F41g 3/14
U.S. Cl. 33—334 4 Claims



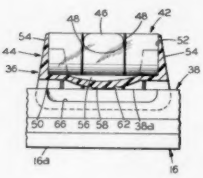
In firearms which must be aimed at elevated firing angles in order to provide the fired projectile with an arcuate trajectory capable of hitting a hidden target, the attainment of the proper firing angle is automatically signaled by the return to zero inclination of a gravity sensing electrolytic switch which had been set at an angle corresponding to the degree of rotation required to position a range indicator at the estimated or known range of the target. A second gravity sensing switch may also be utilized to signal the absence of any transverse canting of the firearm when the required firing angle is attained.

3,824,700

LEVEL WITH NOVEL VIAL MOUNTING ARRANGEMENT

Edward Charles Rutty, Portland, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Oct. 6, 1972, Ser. No. 295,517
Int. Cl. G01c 9/28
U.S. Cl. 33—379 8 Claims



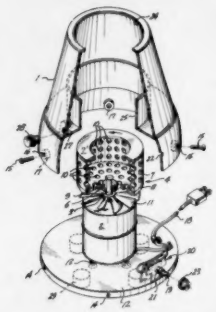
A combination square consisting of a level and rule has mounted thereon a level vial holder comprising a mounting member and a level vial. The level vial is retained in the mounting member in a manner such that with the level vial holder mounted on the combination square the level vial is exposed for a 360° reading. The level vial is retained in the mounting member in a recess which receives both ends of the vial with a snap fit whereby to mechanically lock the vial in place. For purposes of mounting the level vial holder on the combination square, the mounting member is provided with a pair of spaced depending arms between which there is formed an arcuate surface. The level vial holder is mounted by adhesive or other suitable means on a seat comprising a planar surface formed at the outer end of an upstanding portion provided on one leg of the level such that the depending arms of the mounting member straddle the upstanding portion in abutting relation thereto and the arcuate surface is in engagement with the planar surface.

3,824,701

PORTABLE CENTRIFUGAL DRIER FOR SMALL ARTICLES

Bernard W. Norquist, 13320 10th N.E., Seattle, Wash. 98125

Filed Sept. 5, 1972, Ser. No. 286,229
Int. Cl. F26b 17/24
U.S. Cl. 34—58 3 Claims



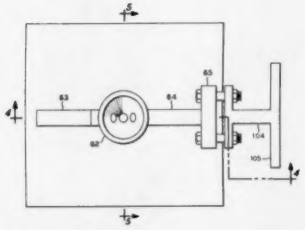
An electric motor carries on its upright shaft a rigid perforated spinning cup and such motor is mounted on a stabilizing weight disk. A frustoconical housing is secured in spaced relationship to the edges of the stabilizing weight disk to provide an annular air passage. The housing top is open to provide an air intake and access to the spinning cup, and such housing includes a water collection trough below the cup bottom. The stabilizing weight disk rests on a plurality of resilient feet.

3,824,702

HOT AIR HEATER FOR CARTON SEALING MACHINE

Silvio T. Farfaglia, Fulton, N.Y., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 7, 1973, Ser. No. 395,033
Int. Cl. F26b 25/00
U.S. Cl. 34—104 10 Claims



In a machine for filling and sealing cartons such as the thermoplastic coated paperboard milk cartons, the heater head for heating the upper portion of the carton prior to sealing comprises a first hot air plenum chamber which enters the open end of the carton and has a continuous outer perforated wall facing the inner surface of the carton and a second hot air plenum chamber which surrounds the outside of the upper end of the carton and has a continuous inner perforated wall

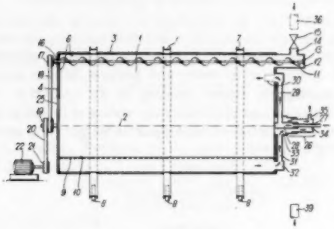
facing the outside surface of the carton. The outer wall of the first plenum chamber and the inner wall of the second plenum chamber form a continuous annular space for receiving the top marginal portion of a carton, with the perforations in both walls being spaced to provide heating of both the inner surface and the outer surface of the full extent of the top marginal portion of the carton. The outer wall of the first plenum chamber extends downwardly and inwardly toward the central vertical axis of the carton while the innerwall of the second plenum chamber extends downwardly and outwardly with respect to the central vertical axis of the carton.

3,824,703

APPARATUS FOR THE BATCH TREATMENT OF SOLID MATERIAL

Paul Moyne, Benite, France, assignor to Rhone-Poulenc S.A., Paris, France

Filed Apr. 6, 1973, Ser. No. 348,521
Claims priority, application France, Apr. 7, 1972, 72.12280
Int. Cl. F26b *11/02*
U.S. Cl. 34—130 **10 Claims**



Apparatus for the batch treatment of solid material, for example for drying the material, in which a chamber is rotatable about a substantially horizontal axis and is divided into two compartments by a horizontal gas permeable partition. A pipeline for the introduction and/or withdrawal of gas or vapour opens into at least one of the compartments and an endless screw conveyor is mounted within the chamber adjacent at least one longitudinal wall thereof. At least one tube for the passage of solid material communicates with the interior of the chamber adjacent the endless screw and a supply and withdrawal conduit are positioned above and below the chamber, respectively, at locations whereby, when said chamber is rotated to one position, said at least one tube can be connected to receive material to be treated from said supply conduit, and, when said chamber is rotated to another position, said at least one tube can be connected to feed treated material to said withdrawal conduit.

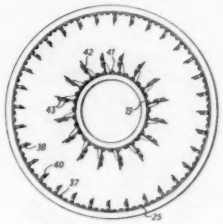
3,824,704

ROTARY DRYER

Richard E. G. Neville, Salisbury, England, assignor to AMF Incorporated, White Plains, N.Y.

Filed Aug. 24, 1972, Ser. No. 283,370
Claims priority, application Great Britain, Aug. 26, 1971, 40050/71
Int. Cl. F26b *11/02*
U.S. Cl. 34—134 **8 Claims**

A rotary dryer, which comprises an outer rotatable cylinder, a plurality of inwardly projecting outer paddles mounted to the inner surface of the outer cylinder, an inner rotatable cylinder of smaller diameter than the outer cylinder mounted coaxially within the outer cylinder, providing an annular space between the two cylinders for receiving material to be dried, a plurality of outwardly projecting inner paddles mounted to the outer surface of the inner cylinder, the inner paddles being spaced from the outer paddles, means for heating the inner and outer paddles, and means for rotating the inner and outer cylinders.

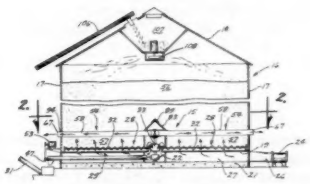


3,824,705

APPARATUS FOR DRYING GRAIN

Norton C. Ives, Rolfe, Iowa 50581

Filed Oct. 16, 1972, Ser. No. 297,813
Int. Cl. F26b *17/14*
U.S. Cl. 34—170 **3 Claims**



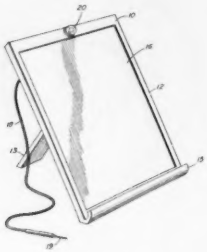
The method and apparatus provides a continuous counter-flow grain drying system for a round bin. An air duct assembly positioned transversely of and over the cross-sectional area of the bin functions as a partition to form an upper wet grain supply chamber and a lower grain drying chamber. The duct assembly is comprised of a plurality of radially extended duct members having open lower sides and circumferentially spaced so as to form grain passages, between adjacent duct members, interconnecting the upper wet grain supply chamber and the lower grain drying chamber. Heated air from the bin floor moves continuously upwardly through the lower drying chamber for discharge to the atmosphere through the duct members, concurrently with a uniform continuous downward flow of grain from the wet grain supply chamber into the lower grain drying chamber and a continuous and uniform removal of dried grain from the bin floor.

3,824,706

EDUCATIONAL DEVICE

Paul P. Scopa, 21 Windsor Dr., Hingham, Mass. 02043, and Naomi S. Kelman, 367 Newton St., Chestnut Hill, Mass. 02167

Filed May 9, 1973, Ser. No. 358,593
Int. Cl. G09b 7/06
U.S. Cl. 35—9 C 3 Claims



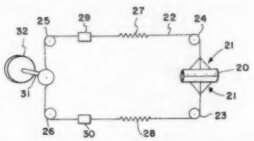
A flexible sheet having indicia and orifices on its front. The sheet has a median conducting layer and rear orifices registerable with selected front orifices. Used with a support containing a source of power and a signal a child actuates the signal when the probe goes into the correct orifice.

3,824,707

APPARATUS FOR APPLYING SIMULATOR G-FORCES TO AN ARM OF AN AIRCRAFT SIMULATOR PILOT

Billy R. Ashworth, Newport News, and John T. Merrill, IV, Yorktown, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed June 9, 1972, Ser. No. 261,183
Int. Cl. G09b 9/00
U.S. Cl. 35—12 E 8 Claims



This invention is a device to be used with an aircraft simulator to apply positive and negative *g*-forces to the pilot's arm. An arm harness fits around the the pilot's arm that he uses to operate the throttle. The device allows the harness to track intentional arm movements without exerting any restraining forces and at the same time applies through the harness *g*-forces to the pilot's arm that are computed by the aircraft simulator computer.

The invention described herein was made by employees of the United States Government and may be manufactured and used by or for the government for governmental purposes without the payment of any royalties thereon or therefor.

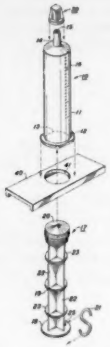
3,824,708

EDUCATIONAL DEVICE

John Lawlor, Tappan, N.Y., and John Sgombick, Ramsey, N.J., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 26, 1972, Ser. No. 318,313
Int. Cl. G09b 23/12
U.S. Cl. 35—19 R 11 Claims

A simple, durable, and inexpensive educational device for demonstrating pressure-volume relationships especially adapted for use by educational institutions below the college level is described. The device comprises a chamber for containing a gas said chamber having openings at its upper and lower end portions. Piston means is provided for selectively controlling the volume and pressure of the gas in the chamber,



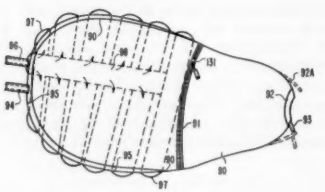
the piston means capable of being inserted in the chamber through the opening at its lower end portion. Means are included for sealing the upper opening in the chamber. The device also includes means secured the piston at its lower end portion, said means adapted to support a weight, and means for supporting the device.

3,824,709

DYNAMIC CHILDBIRTH SIMULATOR FOR TEACHING MATERNITY PATIENT CARE

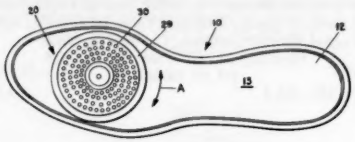
Charles F. Knapp, and George S. Eades, both of Lexington, Ky., assignors to The University of Kentucky Research Foundation, Lexington, Ky.

Division of Ser. No. 308,542, Nov. 21, 1972. This application Nov. 5, 1973, Ser. No. 412,756
Int. Cl. G09b 23/32
U.S. Cl. 35—17 4 Claims



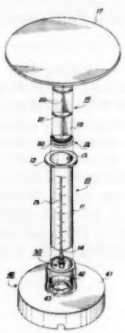
A programmable patient simulator for teaching maternity patient care includes a life size manikin with a pelvis, vaginal canal, uterus, placenta, umbilical cord, and a fetal doll from which heart sounds are emitted. A programmable electropneumatic system controls the simulated uterine contractions, position of the uterus, rupture of membranes, expulsion of fetal doll, and fetal heart rate during labor and delivery sequence. The invention described herein was made in the course of work under a grant or award from the Department of Health, Education and Welfare.

3,824,710
FRICTION-TYPE SWIVEL SHOE
Robert B. Egtvedt, Comstock Park, Mich., assignor to Wolverine World Wide, Inc., Rockford, Mich.
Filed Sept. 10, 1973, Ser. No. 395,927
Int. Cl. A43b
U.S. Cl. 36—2.5 AE 15 Claims



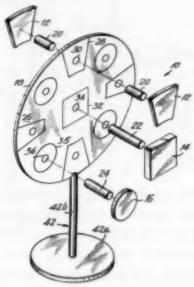
The ball of an athletic shoe sole includes a rotating swivel with a configurated surface engaging bottom. The swivel is integrally molded within the sole of the shoe with a lubricating film positioned between the shoe sole and swivel. The generally circular swivel includes an upwardly and outwardly extending central holding member and a peripheral outwardly extending shoulder for securing the swivel within the shoe sole. A reinforcing ring is integrally molded in the shoe sole and extends around the periphery of the frictional member below the peripheral shoulder to prevent the deflection of the sole material away from the area adjacent the swivel.

3,824,711
EDUCATIONAL DEVICE
John Lawlor, Tappan, N.Y., and John Sgombick, Ramsey, N.J., assignors to Xerox Corporation, Stamford, Conn.
Filed Dec. 26, 1972, Ser. No. 318,314
Int. Cl. G09b *23/12*
U.S. Cl. 35—19 R 11 Claims



A simple, durable, and inexpensive educational device for demonstrating pressure-volume relationships especially adapted for use by educational institutions below the college level is described. The device comprises a chamber for containing a gas, said chamber having openings at its upper and lower end portions. Piston means is provided for selectively controlling the volume and pressure of the gas in the chamber, the piston means capable of being inserted in the chamber through the opening at its upper end portion. Means are included for sealing the lower opening in the chamber. The device also includes a base member for supporting the chamber at its lower end portion, the base member adapted to be in releasable engagement with the chamber.

3,824,712
ART SCULPTURE
Charles W. Powell, 227 E. 50th St., New York, N.Y. 10022
Filed June 9, 1972, Ser. No. 261,387
Int. Cl. G09b *1/06*
U.S. Cl. 35—26 2 Claims



An art sculpture is adapted to be assembled from a plurality of components. The art sculpture includes a plurality of geometrically-shaped cutouts adapted to be mounted on a base member by a plurality of mounting pegs of diverse lengths which are secured to the base member and the shaped cutouts. The base member may include a schematic representation of the geometrically-shaped cutouts and a schematic representation of mounting peg locations in order to facilitate in the assembly of the art sculpture.

3,824,713
SKI BOOT
Franco Vaccari, Via Paleoveneti, Montebelluna, 31044
Filed Dec. 26, 1972, Ser. No. 317,978
Int. Cl. A43b
U.S. Cl. 36—2.5 AL 2 Claims

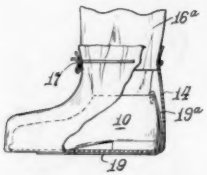
This invention discloses a ski boot consisting of an upper and a sole integral with one another. The sole is formed with a plurality of recesses at the outer border thereof. The ski boot also includes a leg piece or ankle section connected to the upper at an articulation point arranged on the rear part of the boot.

3,824,714

ELECTRICALLY CONDUCTIVE COVERING FOR SHOES

Jacob A. Glassman, 1680 Meridian Ave., Miami Beach, Fla. 33139

Filed Dec. 20, 1972, Ser. No. 317,068
Int. Cl. A43b 3/16
U.S. Cl. 36—7.1 R 5 Claims



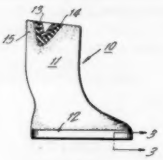
A sanitary covering for a shoe fabricated from a blank of disposable flexible material to provide a total covering for a shoe and having an electrically conductive tape in the bottom or sole portion thereof arranged to have direct conductive contact with the shoe and with a floor surface.

3,824,715

RUBBER OVERSHOES

William A. Vaughan, Jr., Dover, and James Clough, Wyoming, both of Del., assignors to International Playtex Corporation, New York, N.Y.

Filed Dec. 13, 1971, Ser. No. 207,418
Int. Cl. A43b 1/10
U.S. Cl. 36—7.3 7 Claims



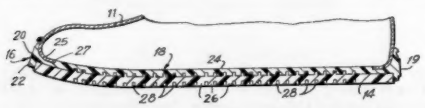
Rubber overshoes in which a flock layer is embedded in and bonded to the rubber overshoe body and, preferably, an outer rubber layer is in turn bonded to the flock layer to define the outer sole of the overshoe. The composite structure imparts improved tear-resistance to the overshoe body and increases resistance of the sole portion thereof to delamination and to abrasion, the resulting product simultaneously exhibiting an attractive, esthetically pleasing appearance.

3,824,716

FOOTWEAR

Anthony George Di Paolo, 175 E. 74th St., New York, N.Y. 10021

Division of Ser. No. 216,610, Jan. 10, 1972, abandoned. This application Nov. 8, 1973, Ser. No. 414,107
Int. Cl. A43b 13/04
U.S. Cl. 36—32 R 3 Claims



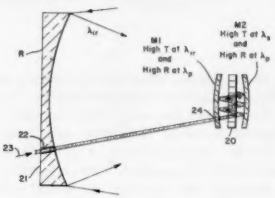
The invention disclosed is directed to skid-resistant footwear having an outer sole provided with grooves and wavy ribs spaced apart by the grooves. Also disclosed is an improved process for making the footwear, including injection molding a bottom onto a footwear upper employing a mold with a bottom plate having wavy elongate uprights.

3,824,717

ENHANCED FIELD OF VIEW PARAMETRIC IMAGE CONVERTER

Viktor Evtuhov; Bernard H. Soffer, both of Pacific Palisades, and David Y. Tseng, Thousand Oaks, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed July 30, 1973, Ser. No. 383,935
Int. Cl. H03f 7/00
U.S. Cl. 307—88.3 13 Claims



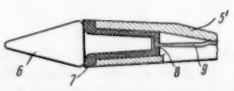
There is disclosed an optical frequency up-conversion system which uses a pair of dichroic mirrors positioned on the optical axis of an infrared collector to produce a multipass traverse of a nonlinear crystal positioned between the mirrors by a beam of pumping radiation in order to enhance the field of view, the conversion efficiency and the resolution of the system. The crystal is placed in the optical path at the interaction area of the infrared beam and the pump beam and between the dichroic mirrors. One of the mirrors is transparent to the infrared frequency and the other is transparent to the up-converter sum frequency. Both mirrors are reflective at the pump frequency. The system may be passive and collect a thermal image or it may utilize a pulsed ir illuminator laser in conjunction with a synchronously pulsed pump laser in order to increase the output power level.

3,824,718

EXCAVATOR BUCKET WITH ELECTROMAGNETIC FIELD WEAKENING TEETH

Lev Borisovich Nekrasov, ulitsa Zheleznovodskaya, 46, kv. 13; Jury Mikhailovich Misnik, Siezdovskaya ulitsa, 7, kv. 2; Zolya Samuilovich Tsukernik, Novo-Izmailovsky prospekt, 34, kv. 3; Semen Davidovich Kriger, prospekt Slavy 17, korpus 1, kv. 200, and Renat Shakhimardanovich Kilkeev, prospekt Maklina, 11, kv. 4, all of Leningrad, U.S.S.R.

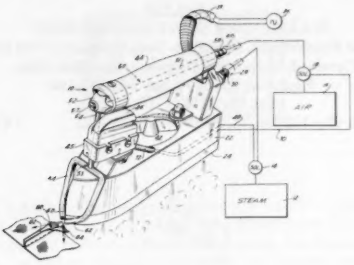
Filed Apr. 2, 1973, Ser. No. 346,885
Int. Cl. E02f 3/00; H05b 9/06
U.S. Cl. 37—118 R 3 Claims



An excavator bucket including soil-breaking teeth mounted on the wall of the bucket, the teeth being in the form of electrodes electrically insulated from one another and electrically connected to a high-frequency generator so that each pair of adjacent teeth forms a capacitor adapted to produce an electromagnetic field reducing the mechanical strength of frozen soil, owing to dielectric heating thereof, whereby effective progress of these soil-breaking teeth into the soil is promoted.

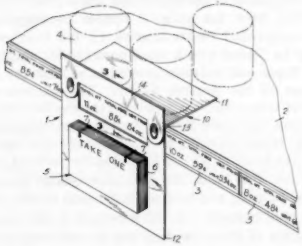
The present invention permits earth-moving jobs to be carried out under conditions of season-long and several years' long freezing of soil, using for this purpose commonly known single-bucket excavators.

3,824,719
SEAMBUSTER IRON
Samuel H. Miranker, Brooklyn, N.Y., assignor to Automatic Steam Products Corp., Long Island City, N.Y.
Filed Aug. 10, 1973, Ser. No. 387,431
Int. Cl. D06f 75/06
U.S. Cl. 38—77.3 **16 Claims**



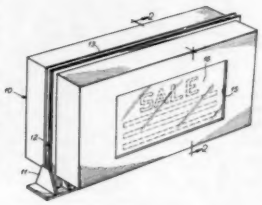
A seambuster iron for pressing "opened" seam edges during construction of a garment is provided with nozzles which emit in a predetermined pattern jets of compressed gas to "bust" or open the seam edges and lay the separated edges flat for subsequent pressing by the iron.

3,824,720
SHELF DISPLAY ARTICLE
John D. Langwell, Freeport, N.Y., assignor to Herman Alexander, Merrick, N.Y.
Filed Sept. 28, 1973, Ser. No. 401,885
Int. Cl. G09f 3/18
U.S. Cl. 40—10 **11 Claims**



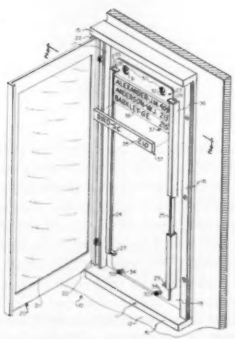
A shelf display device comprising a folded element having a horizontal leaf, and a depending vertical leaf, the horizontal leaf being adapted for placement on a shelf with the vertical leaf in front of the front edge of the shelf. The vertical leaf has a cut-out therein extending horizontally proximate the fold line to expose the front edge of the shelf. The vertical leaf has opposite marginal edge portions at the lateral edges of the cut-out by which the vertical leaf is integrally connected to the horizontal leaf. A bridge portion is connected by interlocking tabs to the marginal edge portions of the vertical leaf and the bridge portion extends across the vertical leaf and above the level of the horizontal leaf while leaving the cut-out substantially open to enable viewing of tags mounted on the edge of the shelf.

3,824,721
OUTDOOR DISPLAY DEVICE FOR SEQUENTIALLY DISPLAYING A SERIES OF PANELS
Robert G. Burns, Sioux Falls, S. Dak., assignor to Pylon Incorporated, Sioux Falls, S. Dak.
Filed June 22, 1972, Ser. No. 265,262
Int. Cl. G09f 11/28
U.S. Cl. 40—32 **9 Claims**



Outdoor traveling display device for a series of panels having signs thereon, in which panels are suspended in end-to-end relation from an endless chain trained in a horizontal plane adjacent and beneath the top wall of a housing for the device. The chain is driven with a series of equally spaced dwells, to index a panel behind a viewing screen of the device and hold the panel in position for viewing for a preselected time interval, and then index a next succeeding panel into position for viewing.

3,824,722
BUILDING DIRECTORY
John Maruscak, and Dale E. Sine, both of Brockville, Ontario, Canada, assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.
Continuation of Ser. No. 199,605, Nov. 17, 1971, abandoned.
This application Oct. 9, 1973, Ser. No. 404,454
Int. Cl. G09f 7/08
U.S. Cl. 40—64 R **1 Claim**

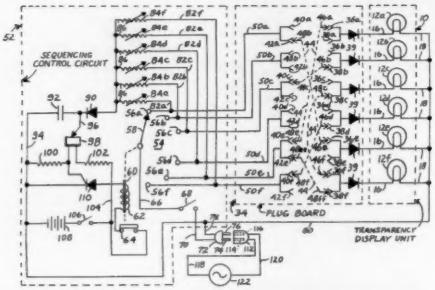


A modular wall mountable directory comprises a base plate having side channels for receiving the ends of indicia carrying strips. The retaining lip of the side channels is of a soft material to permit the front lip to be pulled back to allow an individual strip to be removed while retaining the rest. The strips are also made of a combined stiff and resilient material to facilitate the insertion of letters.

3,824,723
MULTIPLE TRANSPARENCY DISPLAY UNIT AND SEQUENCING CONTROL THEREFOR

Frank A. Gargas, Minneapolis, Minn., assignor to Storyboard Display, Inc., Minneapolis, Minn.

Filed July 10, 1972, Ser. No. 270,329
Int. Cl. G09f *13/10*
U.S. Cl. 40—106.1 5 Claims

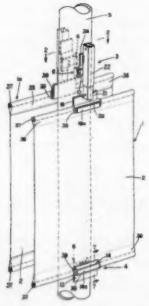


The display unit comprises an electric lamp located in each of its compartments. Various transparencies, each containing an advertising or educational message thereon, are placed over the compartment openings. A plug board enables certain lamps to be selectively energized. A control circuit provides a sequenced energization of the lamps and also an adjustable display period for each lamp.

3,824,724
POLE SIGN CONSTRUCTION

Wendell V. Miller, and Thomas Friedrichsen, both of Massillon, Ohio, assignors to The Massillon Cleveland Akron Sign Company, Stark County, Ohio

Filed Sept. 20, 1972, Ser. No. 290,715. The portion of the term of this patent subsequent to July 23, 1971 has been disclaimed.
Int. Cl. G09f *7/18, 17/00*
U.S. Cl. 40—125 G 3 Claims

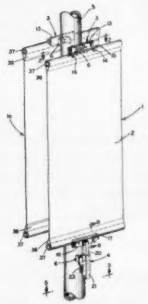


A pole banner sign construction which has rugged permanent hardware for supporting a flexible banner generally in a fixed position on a pole. The hardware except for simple mounting plates at the upper and lower ends of the banner may be removed from the pole. A simple rectangular flexible banner is supported under tension on the hardware and is adapted to be folded into a small package for shipment in an envelope. Rigid pull rods are located in the hems at the upper and lower edges of the flexible banner. The hardware support means at the upper and lower ends of the flexible banner positions the pull rods endwise, holds the pull rods against rotation, holds the pull rods in parallelism, and maintains longitudinal tensional pull on the flexible banner between the rigid parallel pull rods. The hardware in maintaining the pull rod parallelism under tension also holds the pull rods against pivotal movement on, or twisting and turning movement about, the pole. A pair of flexible banners may be mounted in the same way on opposite sides of the pole, and any banner may be changed from time to time without the use of any tools merely by detaching the pull rods from the support means, then transferring pull rods from an initial banner to a replacement banner, and then reengaging the pull rods of the replacement banner in place.

3,824,725
POLE BANNER SIGN CONSTRUCTION

Thomas Friedrichsen, Massillon, Ohio, assignor to The Massillon-Cleveland-Akron Sign Company, Massillon, Ohio

Filed Aug. 23, 1972, Ser. No. 283,100
Int. Cl. G09f *07/18, 17/00*
U.S. Cl. 40—125 G 3 Claims



A pole banner sign construction which has rugged permanent hardware for supporting a flexible banner generally in a fixed position on a pole. All of the hardware excepting simple mounting plates at the upper and lower ends of the banner is removable from the pole. A simple rectangular flexible banner is supported under tension on the hardware and is adapted to be folded into a small package for shipment in an envelope. Rigid pull rods are located in hems at the upper and lower edges of the flexible banner. The hardware support means at the upper and lower ends of the flexible banner holds the pull rods in parallelism and maintains longitudinal tensional pull on the flexible banner between the rigid parallel pull rods. The hardware in maintaining the pull rod parallelism under tension also holds the pull rods against pivotal movement on, or twisting and turning movement about, the pole. A pair of flexible banners may be mounted in the same way on opposite sides of the pole, and any banner may be changed from time to time without the use of any tools merely by unhooking several hooks from banner engagement, then transferring pull rods from an initial banner to a replacement banner, and then hooking the replacement banner in place.

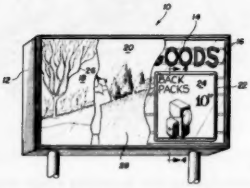
3,824,726
CHANGEABLE MULTIPLE IMAGE DISPLAY APPARATUS

Wilfried Schubert, Bensenville, Ill., assignor to National Advertising Company, Bedford Park, Ill.

Filed Oct. 4, 1972, Ser. No. 294,791
Int. Cl. G09f *13/04*
U.S. Cl. 40—132 R 4 Claims

An improved removable display film carrier for changeable copyboards including a carrier panel frame with a display sur-

face, means for removably mounting the frame onto changeable copyboards, a flexible display film bearing an image on at least one face, and a plurality of elastomeric tensioning members, each tensioning member having one end attachable to a panel frame corner, another end attachable to the flexible film corner, and a stretchable middle portion, the flexible display film being held under constant tension on the carrier frame, centered on and slightly spaced from the inside display surface. The display film can be readily changed and replaced as desired to correlate with a worded message. A three-in-one display including a supporting structure, a light diffusion plate



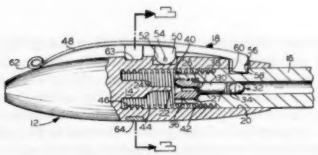
having a background image mounted rearwardly in the supporting structure, a changeable display film mounted in a carrier frame and in front of the diffusion plate, the display film bearing an image which is compatible for display purposes when viewing the diffusion plate image overlaid by the display film image, elastomeric tensioning members for mounting the display film in constant tension suspension within the carrier frame, and a changeable copyboard mounted to the front side of the carrier frame. The three-in-one display can accommodate a smaller display film carrier panel removably mounted on the changeable copyboard to provide a four-in-one display.

3,824,727

MINI-CALIBER FIREARM FOR LAUNCHING HYPERVELOCITY PROJECTILES

Colin M. Hudson, Moline, Ill., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 14, 1973, Ser. No. 388,310
Int. Cl. F41c *9/02*
U.S. Cl. 42—1 J **7 Claims**



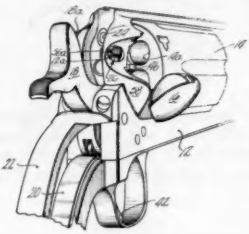
In order to provide an accurate, low-mass, highly effective personal weapon, a firearm has been designed. The projectile mass is such that the ratio thereof to the firearm mass will provide a weapon of extremely light weight and yet heavy enough to be virtually unaffected by the recoil forces generated during the firing thereof, but sufficient for excellent lethality. The components of the weapon are limited to a hand-held receiver, a barrel slidably disposed in the forward end of the receiver, a coiled tension spring for coupling the barrel to the receiver, a sear for releasably retaining the barrel in a forward cocked position against the bias of the spring, and an optional safety for blocking release of the sear. Upon release by the sear, the barrel is biased rearwardly to bring the cartridge chambered therein into firing contact with a fixed striker in the receiver.

3,824,728

CROSS BOLT SAFETY FOR SINGLE ACTION REVOLVERS

Ralph C. Kennedy, Wapping, Conn., assignor to Colt Industries Operating Corp. (Firearms Division), Hartford, Conn.

Filed May 17, 1973, Ser. No. 361,043
Int. Cl. F41c *17/04, 1/00*
U.S. Cl. 42—66 **4 Claims**



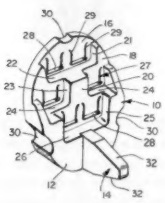
A single action revolver has a manually operable safety bolt mounted in the rear of the frame. The cross bolt safety is slideable in a lateral manner with respect to the frame from an inactive position to an active position in which it is adapted to contact the hammer during falling movement and terminate its fall so that the revolver will not fire. A hand secured to the hammer contacts the cross bolt safety as the hammer attains the cocked position and displaces the cross bolt safety from the active position to the inactive position in which the hammer fall is untrammeled.

3,824,729

REVOLVER LOADER

Paul P. Kubik, 304 Llewellyn Rd., Ambler, Pa. 19002

Filed June 28, 1973, Ser. No. 374,383
Int. Cl. F42b *39/04*
U.S. Cl. 42—89 **16 Claims**



A revolver loader having a base element with self-entrapped retaining elements placed so as to secure ammunition thereto. In a preferred embodiment, a camming element projects from the base member and during the coaxial loading thrust of the loader toward the revolver cylinder the camming element will cause the ammunition to be released from the retaining elements as it is deposited in the revolver cylinder ammunition chambers. In another preferred embodiment, the base element is stepped to secure ammunition at three levels to assist in its initial placement into the revolver cylinder chambers.

3,824,730

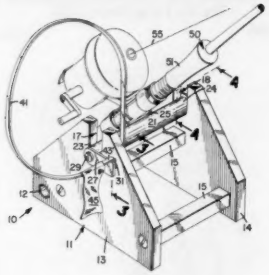
FISHING ROD HOLDER

Robert L. Johnson, P.O. Box 100, Glendive, Mont. 59330

Filed June 27, 1973, Ser. No. 374,181
Int. Cl. A01k *97/12*
U.S. Cl. 43—17 **7 Claims**

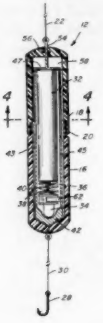
The disclosed device comprises a frame mounting a rotatable shaft for holding a fishing rod in a suitable position for fish-

ing. The device permits the rod to move downwardly in response to a pull on the fishing line. This downward movement rotates the shaft and a keeper plate mounted thereon releases a signaling device. Preferably, a stop element



mounted on the frame under the travel of the keeper plate ensures that the signaling device will be released, and adjustment of the relative positions of the shaft and/or keeper can determine the sensitivity of the signaling function of the device.

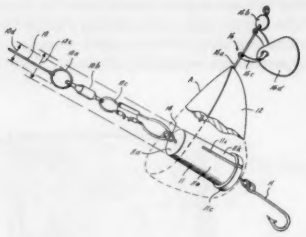
3,824,731
FISH LINE LIGHT
Delmer J. Sandschaper, 3301 S. Trenton, Tulsa, Okla. 74105
Filed Sept. 18, 1972, Ser. No. 289,595
Int. Cl. A01k *75/02*
U.S. Cl. 43—17.5 **4 Claims**



This invention describes a fishing line light which is designed to have negative buoyancy so that it will sink in the water. It comprises a water-tight case, at least the bottom part of which is of translucent material. Inside the case is a lamp, a battery and a pair of contacts normally held apart by spring means. The device is supported by a cord attached to a float on the surface of the water, and a fish hook is attached to a cord which also is attached to a part of the device.

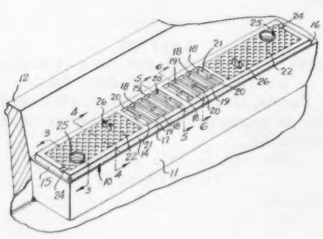
In one version of the apparatus the contacts are mounted one on each of the battery and the lamp. The fish line is attached to the battery while the support cord is attached to the lamp and the case. When the fish pulls on the hook, the contacts are brought together and the lamp is lighted. The lamp is on the bottom end of the case and illuminates the water area around the case for the purpose of attracting fish. The spring is fairly weak so that a very small pull on the hook will cause the lamp to be lighted. It is the flickering light due to momentary or extended contacts that is used to attract the fish to the hook.

3,824,732
FISHING LURE
Robert L. Boone, P.O. Box 11101, Houston, Tex. 77016
Filed Sept. 5, 1972, Ser. No. 286,176
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.05 **5 Claims**



A releasable fishing lure including a base member and hook attached to a fishing line and a lure body having a bore therethrough, the lure body being mounted on the base member with releasable, frictional connection therebetween whereby the lure body is releasable for movement along the fishing line away from the hooked fish.

3,824,733
OPEN TOP COMPARTMENTED LID
Carl R. Cordell, Jr., P.O. Box 2020, Hot Springs, Ark. 71901
Filed Dec. 22, 1972, Ser. No. 317,777
Int. Cl. A01k *97/06*
U.S. Cl. 43—54.5 R **4 Claims**

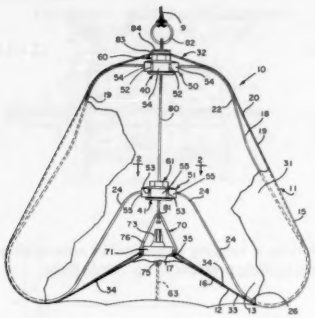


An open top compartmented lid is integrally formed of plastic and has a plurality of generally rectangular compartments of varying sizes formed centrally in the upper surface thereof to receive a plurality of fishing tackle items supported therein temporarily while other items are being used for fishing. A support for a fishing rod is formed in the plastic lid and includes a well to receive the reel on the rod without requiring the removal therefrom. A plurality of stiffening members extend waffle-like across two end portions of the lid for strengthening the lid and providing small compartments for temporarily storing relatively small items of fishing gear or tackle. The lid includes substantially upright side walls supporting a generally horizontal top wall integrally formed thereon.

3,824,734
INSECT TRAP
Baltassar Bottos, 361 Marlton Ave., Camden, N.J. 08105
Filed June 6, 1973, Ser. No. 367,634
Int. Cl. A01m *1/10*
U.S. Cl. 43—121 **4 Claims**

A collapsible construction for an insect trap adapted to be suspended over a pet feeding bowl, the trap being downwardly

concave and comprising a downwardly divergent circumferential outer wall and an inner wall extending upwardly and inwardly about the lower region of the outer wall, both walls



combining to enclose a space therebetween. The inner wall terminates at a central opening in which bait support means is mounted for enticing insects upwardly through the opening into the enclosed space.

3,824,735

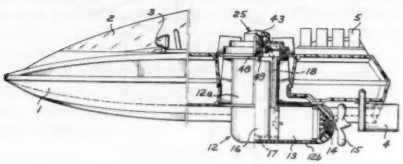
TOY BOAT WITH SEPARATE COMPARTMENT FOR BATTERY AND MOTOR

Horst Brandstatter, Zirndorf, Germany, assignor to Georg Brandstatter, Zirndorf, Germany

Continuation-in-part of Ser. No. 161,043, July 9, 1971, abandoned. This application July 25, 1973, Ser. No. 382,593

Int. Cl. A63h *23/04*

U.S. Cl. 46—243 MV **9 Claims**



There is disclosed a power driven toy boat, the power plant of which is accommodated within the hull of the body. For this purpose a housing containing an electric motor driving a propeller and a battery for energizing the motor are provided. This housing is insertable into an opening extending crosswise through the hull of the boat and is retained therein by self-engaging shoulders on the housing and the wall of the opening. The housing is sealed off except for an opening to permit exchange of the battery or repairs. This opening which is closable by a lid, is above water when the boat is floating so that there is no danger of leakage of water into the housing. A switch is provided on the lid to actuate the motor.

3,824,736

METHOD AND APPARATUS FOR PRODUCING PLANTS

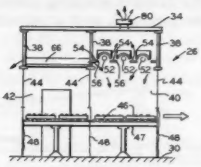
Noel Davis, Russell, Ohio, assignor to Integrated Development and Manufacturing Company, Chagrin Falls, Ohio

Continuation of Ser. No. 87,795, Nov. 9, 1970, abandoned. This application Jan. 22, 1973, Ser. No. 325,713

Int. Cl. A01g *9/24*

U.S. Cl. 47—17 **5 Claims**

A method and apparatus for the continuous production of plants. The method comprises moving the plants through a corridor wherein closely controlled conditions of temperature and humidity are maintained. The corridor is preferably formed by a series of modular units each of which inludes an



illuminated section and a darkened section. Each modular unit is arranged to constitute one twenty-four hour growth period so that merely by varying the number of modules, growing cycles of any desired duration can be provided.

3,824,737

APPARATUS FOR GRIT BLASTING THE EDGE OF A PLATE LIKE MEMBER

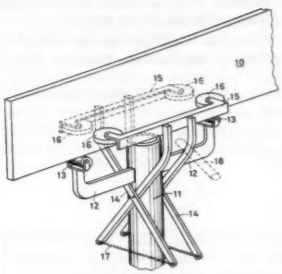
David Wenzel Alexander Janson, Smedbodalsvagen, Sweden, assignor to ESAB-Hebe Aktiebolag, Orebro, Sweden

Filed Nov. 21, 1972, Ser. No. 308,470

Claims priority, application Sweden, Dec. 1, 1971, 15379/71

Int. Cl. B24c *3/32*

U.S. Cl. 51—8 **1 Claim**



An apparatus for grit blasting the edge of a plate or the like comprises a frame carrying shield means enclosing a portion of the edge, at least one jet nozzle for directing a stream of blasting grit and compressed air towards the enclosed portion of the edge, and two sets of rollers for positioning said nozzle in relation to the edge. One set of said rollers is mounted on a loaded pincer like tool to make the apparatus suited to work on plates of different thicknesses.

3,824,738

PIPE CLEANING APPARATUS

Wayne C. Hall, deceased, late of Salt Lake City, Utah; by Scott D. Allen, executor, Oregon City, Oreg., and Wayne C. Hall, Jr., 20100 S. Beavercreek Rd., Oregon City, Oreg. 97045

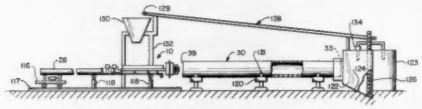
Filed Nov. 1, 1972, Ser. No. 302,637

Int. Cl. B24c *3/32*

U.S. Cl. 51—9 **12 Claims**

An apparatus and method for cleaning the inside of pipes by throwing abrasive material into contact with the internal surface of the pipe from a rotating wheel moving longitudinally therethrough, wherein the abrasive material and the material abraded from the pipe are expelled from an open end of the pipe during the cleaning operation by an air flow created by the rotating wheel. One embodiment of the invention includes a carriage movable into and out of the pipe, an abrading wheel

rotatably mounted on a tubular housing carried on the forward portion of the carriage, an auger conveyor for supplying the wheel with abrasive material, and a shroud mounted behind the wheel for reducing the effective cross-sectional area of the pipe. The rotating abrading wheel is inserted in one open end of the pipe and, as it is moved through the pipe,



creates an air flow which moves the abrasive material and the material abraded from the pipe out of the opposite open end of the pipe. The abrasive material is then separated from the material abraded from the pipe for reuse on subsequent pipes. The abrading wheel is comprised of a front disc, a rear annulus having an outer diameter less than the diameter of the disc and a plurality of blades interconnecting the disc and the annulus.

3,824,739

METHOD AND APPARATUS FOR CONTINUOUSLY REMOVING BURRS FROM OBJECTS

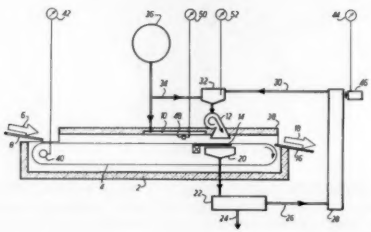
Bernard Moret, Bondy, and Jean-Louis Dufetele, Saint Etienne du Rouvray, both of France, assignors to L'Air Liquide, Societe Anonyme Pour L'Etude Et L'Exploitation Des Procedes Georges Claude, Paris, France

Filed Feb. 23, 1973, Ser. No. 335,317

Claims priority, application France, Feb. 29, 1972, 72.06765

Int. Cl. B24c *3/14, 5/00*

U.S. Cl. 51—9 **4 Claims**



A device for removing burrs from objects thermally insulated from the ambient air consists of subjecting the objects to a blast of granular shot, which is re-cycled after separating-out the removed burrs and is led back to a storage hopper, the shot being continuously insulated thermally from the ambient air and being cooled, simultaneously with the objects by a cold gas in the liquefied form or in course of vaporization. The apparatus comprises a shot-blasting chamber in the form of a heat-insulated tunnel containing a continuously moving conveyor belt on which the objects are disposed.

3,824,740

POWER FEED SANDER

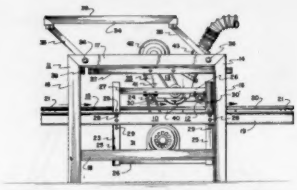
Raymond C. Richardson, Rt. 2, Meridian, Idaho 83642

Continuation-in-part of Ser. No. 235,979, Mar. 20, 1972. This application Aug. 31, 1972, Ser. No. 285,411

Int. Cl. B24b *7/10, 7/00*

U.S. Cl. 51—33 R **4 Claims**

The power feed sander comprises a frame assembly including a frame and a table, a feed assembly including suitably driven rollers mounted transversely above the table on the frame, and a carriage assembly suitably mounted to the frame



and including a sanding subassembly controllable as to its downward sanding pressure by an inertia plate.

3,824,741

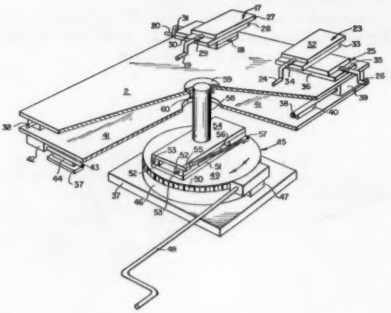
METHOD AND APPARATUS FOR TRAVERSING A CAM FOLLOWER

Harold R. Wilson, 708 Colonial Dr., Wilmington, N.C. 28401

Division of Ser. No. 76,653, Sept. 28, 1970, abandoned. This application Apr. 17, 1972, Ser. No. 244,891

Int. Cl. B24b *17/02*

U.S. Cl. 51—50 PC **8 Claims**

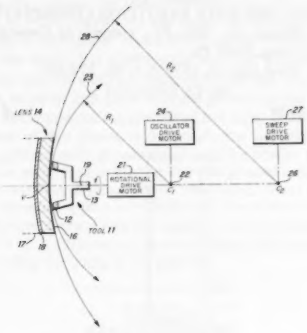


A system for the machining of work pieces, particularly the abrading of die rolls for a tube reducing mill, where the work piece and the master pattern or cam are mounted for rotation on a common shaft and moved relative to a master follower and rotating tool, respectively, with this relative movement being biased translation with only the angle of the translation varying with respect to the axis of rotation for causing the follower to traverse the entire control surface of the master and correspondingly cause the tool to duplicate the master control surface in the work piece. The follower and tool are mounted on a common table, which table is mounted with respect to a base for only translation, that is, the table will not rotate with respect to the separately mounted master and work piece. A slide mechanism allowing only translation of the table is rotated independently of the table to traverse the direction of table translation through an angle of 180°. Elements are provided to bias the table in the direction of translation so that with the 180° rotation of the slide, the follower will traverse the entire control surface of the master, in one plane. The master is rotated about an axis parallel to the above-mentioned plane so that its entire three dimensional surface will be engaged by the follower.

3,824,742
TORIC SURFACE GENERATING METHOD AND APPARATUS

Wiktor J. Rupp, Lowell, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed July 7, 1972, Ser. No. 269,664
Int. Cl. B24b *1/00, 13/02*
U.S. Cl. 51—54 **14 Claims**



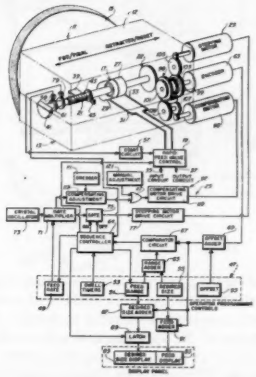
Method and apparatus for generating a true toric surface on a lens or other work piece. In accordance with the invention, a cup-shaped surfacing tool is adapted to be moved across a lens blank in a compound motion comprised of an oscillating movement in a first curved path having a radius equal to the radius of curvature desired in the direction of one major meridian of the surface coupled with a sweeping movement in a second curved path having a radius equal to the radius of curvature desired in the direction of the second major meridian of the surface. The tool is aligned relative to the lens surface such that the oscillating movement will be within a plane parallel to the tool axis such that substantially the entire abrasive surface of the tool will operate on the lens surface. This will avoid the formation of ridges on the surface and, at the same time, permit the generation of high quality toric surfaces of any desired curvature with a single tool and with relatively simple kinematics.

3,824,743
MACHINE TOOL CONTROL SYSTEM

Ralph E. Price, and Stanley C. Schoonover, both of Waynesboro, Pa., assignors to Landis Tool Company, Waynesboro, Pa.

Filed May 22, 1973, Ser. No. 362,877
Int. Cl. B24b *49/00*
U.S. Cl. 51—165.71 **6 Claims**

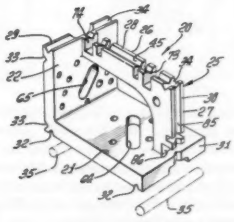
A machine tool control system moves a grinding wheel from a retracted position to a forward position by applying hydraulic fluid to a hydraulic cylinder to effect a rapid forward movement of the grinding wheel whereupon further movement of the grinding wheel to a final position is effected by supplying a predetermined number of pulses to a stepping motor for driving a feed screw in accordance with a predetermined sequence of grinding movements. The actual advancement of the grinding wheel is monitored by an absolute multiturn encoder rotatably associated with the feed screw and producing a signal which is compared to a combined signal representative of the desired size of the workpiece in the range of grinding. With each grinding sequence, the portion of the feed range signal is reduced to create a difference from a signal produced by the encoder so as to operate a sequence controller to effect advancement of the grinding wheel by supplying pulses to a stepping motor drive circuit connected to controlling relation with a stepping motor connected to a feed screw through a gear train. When the workpiece is ground to the desired size, the sequence controller operates to reversely rotate the stepping motor and reverse the application of hydraulic fluid to return the grinding wheel to a retracted position. The desired size of the workpiece and the advancement of the grinding wheel under the control of the encoder are displayed by suitable gauges on a display panel. The mechanical relation of the encoder to the grinding wheel may be calibrated by a calibration offset signal for increasing or decreasing the signal produced by the encoder indicating the position of the grinding wheel. To enable the actual position of the grinding wheel to be varied without disturbing the relationship between the encoder and the stepping motor in associated circuitry, the feed screw is driven through a gear train including a differential. The encoder is associated with the input gear of the differential while a compensating motor and associated circuitry are provided for rotating the output gear of the differential without effecting the rotational movement of the encoder.



3,824,744
MULTI-PURPOSE WORK HOLDING MEANS

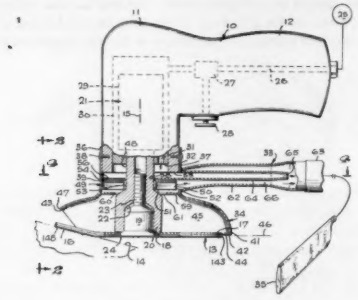
Robert G. Petrant, 1531 Silverlake Blvd., Los Angeles, Calif. 90026

Filed July 31, 1972, Ser. No. 276,392
Int. Cl. B24b *41/06;* **B23q** *17/18*
U.S. Cl. 51—217 A **6 Claims**



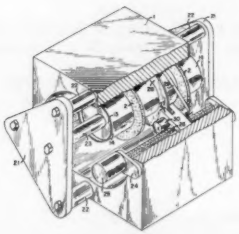
A work holder device providing precise multipositioning of a work piece with respect to three dimensional and angular relationships for the machining, grinding and the like of surfaces on the work piece. A work holder body member of right angle type constructed and arranged to provide holding and securing of a work piece in a multitude of desired positions with a reduced set up time and providing for elimination of some set up steps normally employed in the positioning of a work piece for a working operation.

3,824,745
SUCTION SYSTEM FOR ABRADING TOOL
Alma A. Hutchins, 49 N. Lotus Ave., Pasadena, Calif. 91107
Filed Aug. 21, 1972, Ser. No. 282,340
Int. Cl. B24b *23/02, 55/06*
U.S. Cl. 51—170 T **18 Claims**



A work abrading tool having a suction system for withdrawing abraded particles from the work surface to a collection location. The suction system preferably includes a fan or fans driven by the motor of the abrading tool and producing a flow of air which partially or wholly creates the suction effect. For best results, the fan or fans and an aspirator coact to produce together the suction flow of air.

3,824,746
WANKEL ENGINE CYLINDER GENERATING MACHINE
Gordon James Watt, 245 Anguowa, Apt. 106, Fairfield, Conn. 06430
Filed July 13, 1972, Ser. No. 271,538
Int. Cl. B24b *19/00, 17/00*
U.S. Cl. 51—245 **7 Claims**

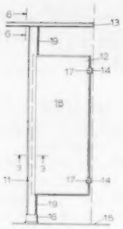


The generating machine comprises complementary tools called the lobe generator and the neck generator, together capable of machining the cylinder contour for a Wankel engine. An inside-out machine structure is disclosed wherein the tools are supported and guided by the workpiece. Compatible structural rigidity and freedom of motion is provided by hydrostatic bearing spindles and slides.

The lobe generator operates somewhat like the conventional cylindrical grinder or boring machine with the important provision of an articulated arm comprising the cutter center itself and an eccentric bearing. Said bearing is a Wankel type stator-rotor pair which produces a third harmonic radial compensation and is also used to produce torque to swing the cutter around the eccentric pivot point. Key to the generating concept is natural transfer of the cutting center to the region of the cusps of the evolute of the arch, without radial change or change in tangential direction of the cutter edge.

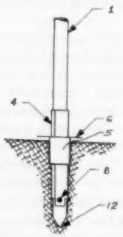
The neck generator is a mechanical analogue of the Wankel rotor, having two edges which ride the arches completed by the lobe generator and a third edge which is the cutting tool. Said tool machines the cusp region of the epicycloidal cylinder to where it joins the arches already produced by the lobe generator. Key to the invention is capability of the lobe generator to complete enough of the cylinder surface to guide the neck generator.

3,824,747
PILASTER AND WALL PARTITION COMBINATION
George M. Zehner, Jr., Erie, Pa., assignor to General Partitions Mfg. Corp., Erie, Pa.
Filed July 25, 1972, Ser. No. 274,882
Int. Cl. E04b *2/28*
U.S. Cl. 52—239 **4 Claims**



A pilaster and panel combination is disclosed. The panel is adapted to be supported on a wall between the floor and the ceiling. The pilaster is made from an aluminum extrusion U-shaped in cross section and it has a recess between its spaced legs, and the pilaster is longer than the panel. The panel is received between the space legs of the pilaster at an intermediate part of the pilaster. Two trims strips are held in place between the legs of the U-shaped extrusion outboard of the panel. One strip extends from the panel to the floor and the other strip from the panel up to a head rail. The trim strips are held in place between the legs of the extrusion by a series of grooves and beads in the legs of the extrusion and the legs of the trim strips.

3,824,748
PERMA LAND BOUND STAKE DEVICE
John R. Pichowicz, Westville Rd., P.O. 51, Plaistow, N.H. 03865
Filed Feb. 14, 1973, Ser. No. 331,340
Int. Cl. E04f *9/02*
U.S. Cl. 52—103 **5 Claims**



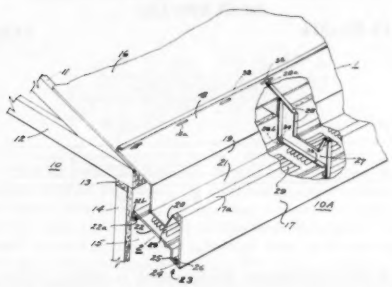
This invention relates to a permanent marker stake for use by surveyors. The stake has a top blunt end and a bottom pointed end and carries two blades pivoted to the stake above the pointed end. The free ends of the blades are sharpened

and the pivot ends have an abutment to bear against the stake when the blades pivot outwardly. A sleeve having a flange at its upper end is slidably mounted on the stake from a lower position at which the blades are held adjacent the stake to a position above the blades. In the upper position the blades are free to pivot outwardly of the stake. A tension spring is located between each blade and the stake to urge the blades to pivot outwardly when the sleeve has moved to free the blades. Before the stake is driven in the ground the sleeve is in downward position retaining the blades against the stake. At a specific point on the ground the stake is driven into the ground by a hammer or other means. As the stake moves into the ground the flange of the sleeve contacts the ground stopping movement of the sleeve but allowing the stake to further penetrate the ground and the sleeve to release the blades. The blades are then free to pivot and move into the ground to the side of the stake. A short upward movement of the stake causes the sharpened end of the blades to penetrate the ground and move into the ground until the abutments on the blades contact the stake. The stake is then locked into the ground and cannot be removed without digging it out. The upper blunt end of the stake is covered with a cap member. The entire stake has a non-corrosive surface and the upper end of the stake may be covered with a fluorescent material below the cap for more easily locating the stake in the ground.

3,824,749
EAVE STRUCTURE

Thomas W. Scherf, Vandergrift, Pa., assignor to Aluminum Company of America, Allegheny, Pa.

Filed Nov. 29, 1972, Ser. No. 310,433
Int. Cl. E04d *13/06*
U.S. Cl. 52—11 **5 Claims**



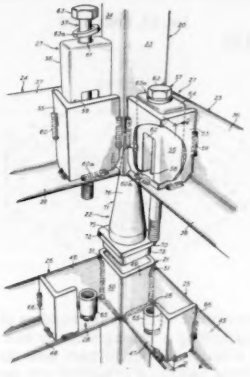
A structural eave assembly readily installable and attachable to a building originally constructed without an overhanging eave comprises a separately fabricated, unitary structure having combined gutter, soffit, and fascia portions.

3,824,750
COLUMN CONNECTOR SYSTEM

Anthony A. Antoniou, 23 Baybrook Ln., Oak Brook, Ill.

Continuation of Ser. No. 203,780, Dec. 1, 1971, abandoned. This application June 18, 1973, Ser. No. 370,845
Int. Cl. E04b *1/348*
U.S. Cl. 52—79 **5 Claims**

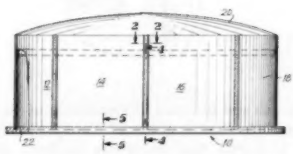
A mechanical connector system for interjoining and aligning tandem related tubular column sections utilizing a unitary cast connector having a planar platform portion for abutting engagement with adjacent ends of the column section members, a conical guide portion extending outwardly on one side of the platform portion and a depending polygonal flange portion protruding from the opposite side thereof for interfitting engagement with the interior walls of related column section members. Ancillary tie-bolt means are also utilized between structural support framing members associated with the column sections to positively lock the latter in assembled position.



3,824,751
PRECAST CONCRETE WALL STRUCTURE FOR WASTE TREATMENT TANKS

Charles Shelander, Dix Hills, N.Y., assignor to Preload Technology, Inc., Long Island City, N.Y.

Filed June 23, 1972, Ser. No. 265,594
Int. Cl. E04h *7/20*
U.S. Cl. 52—173 **3 Claims**

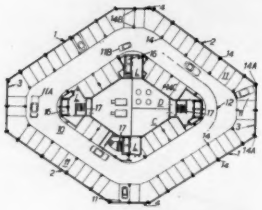


A construction for a waste treatment tank comprised of a plurality of precast concrete panels extending to approximately the full height of the tank is shown. Each of the precast concrete panels has a plurality of horizontal stressing tendons which are freely movable and pass through the panels and through continuous vertical edge plates on either side of the panels. Coupling plates attached to the edge plates are butt-welded to one another at their junctions. The tension in the prestressing tendons may be controlled at any time before, during or after the erection of the tank and the construction configuration provides easy access to the prestressing tendons. The configuration is particularly well suited for the through passage of piping connection and for the attachment of internal structure to the steel coupling plates.

3,824,752
MULTI-STOREY BUILDINGS

Maurice Weston, 70A Arlington House, Arlington St., St. James', London, S.W. 1, England

Filed Feb. 7, 1973, Ser. No. 330,427
Claims priority, application Great Britain, Feb. 8, 1972, 5879/72
Int. Cl. E04h 6/00
U.S. Cl. 52—176 36 Claims

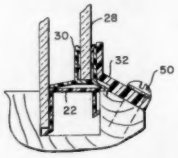


There is described a variant of the building of U.S. Pat. No. 3,290,837, comprising a carriageway for exit and entry of vehicles with a margin at one or both sides for parking: the outline plan of the building is octagonal with opposite sides of equal length but with adjacent sides of unequal length; and the building is supported on columns with those at each apex at the shorter sides of the building arranged on radii from a centre which lies on the axis passing between the apex at the complementary opposite one and in vicinity of the arc which on the helical floorway defines the centreline of the carriageway at the apex, whereby at each apex on the usable part of carriageway vehicles can be parked.

3,824,753
WINDOW STRUCTURE

Richard N. Anderson, Owensboro, Ky., assignor to V. E. Anderson Mfg. Co., Owensboro, Ky.

Filed May 18, 1970, Ser. No. 38,453
Int. Cl. E06b 3/28
U.S. Cl. 52—203 5 Claims



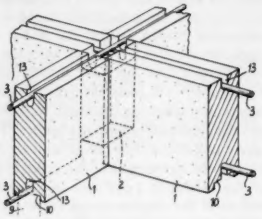
A storm sash and structure for installation of the storm sash on a prime window sash is disclosed. The storm sash includes a generally U-shaped dual durometer hardness plastic strip secured to a glazing panel around the periphery thereof. The structure for installation of the storm sash includes, in different modifications, extensions of the cross section of the glazing strip and/or various retainer clips.

3,824,754
BUILDING STRUCTURE MADE OF STANDARDIZED COMPONENTS

Albert Fatosme, 14 rue, des, Terrasses-14, Caen, and Henri Coste, 3 Place Pireire Pair 170, Paris, both of France

Filed June 1, 1972, Ser. No. 258,509
Claims priority, application France, June 7, 1970, 70.20428
Int. Cl. E04c 3/26, 5/08
U.S. Cl. 52—228 17 Claims

A prefabricated building structure constituted mainly by two orthogonal series of parallel rows of successive plank sections separated by gaps, all the plank sections being of substantially the same length so as to define a square meshed system, the apices of the meshes of which register with the gaps. The system is assembled at ground level with blocks filling the gaps and with horizontal tensioning wires. It is then

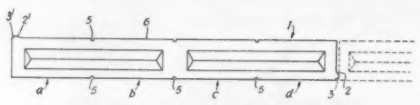


raised so as to form a coffered ceiling which is covered before its raising by a planking or the like covering means. The ceiling thus formed and held transiently in position is secured definitely in position by walls, partitions or uprights fitted between it and a floor slab.

3,824,755
RAPID LAY BUILDING BRICKS

William John Hartnell, Station Rd., Much Hadham, England

Continuation of Ser. No. 66,440, Aug. 24, 1970, abandoned.
This application Oct. 2, 1972, Ser. No. 293,855
Int. Cl. E04c 1/12
U.S. Cl. 52—314 1 Claim



A multiple component building brick in which grooves are used to simulate separation of the bricks, the brick being preferably of lightweight concrete material and having a projection or nib on an end face and preferably on a rear face to assist correct spacing corresponding to the grooves, including a set of bricks.

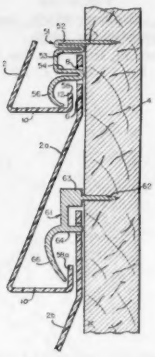
3,824,756
NAILING CLIP FOR PLASTIC SIDING

Gerald Kessler, 388 Cransberry Rd., Boardman, Ohio 44512

Filed Aug. 18, 1972, Ser. No. 281,949
Int. Cl. E04d 1/34
U.S. Cl. 52—548 4 Claims

Siding for house exteriors is now commonly made to simulate clapboards and has an integral top locking strip having a downward projection spaced from the body of the siding into which an upturned projecting strip, on the bottom of the next higher course of siding can be fitted when applying the siding to a house. The present disclosure eliminates this integral

locking strip and provides instead small nailing clips of a special construction which are less expensive and which are constructed so that the siding can be nailed in place loosely, which is desirable to permit thermal expansion and contraction of the siding.

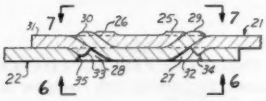


3,824,757

METHOD OF JOINING SHEET METAL, AND SHEET METAL JOINTS

Vernon W. Coop, Pico Rivera, Calif., assignor to Brazil H. Snyder, Bell Gardens, Calif.

Division of Ser. No. 107,256, Jan. 18, 1971, Pat. No. 3,728,881. This application Aug. 14, 1972, Ser. No. 280,128
Int. Cl. F16b *5/00*
U.S. Cl. 52—758 D **7 Claims**



A first slit aperture means is formed in a first sheet metal portion and first protruding leg means is formed from the excess metal from the first slit aperture means. A second slit aperture means is formed in a second sheet metal portion and second protruding leg means is formed from the excess metal from the second slit aperture means. The sheet metal portions are then positioned so that a surface of the second sheet metal portion is contiguous to a surface of the first sheet metal portion and so that the second leg means extends through the first slit aperture means. The leg means are then crimped to sandwich the second leg means between the first leg means and a surface of the first sheet metal portion and to sandwich a portion of the first sheet metal portion between the second leg means and a surface of the second sheet metal portion to form the completed joint.

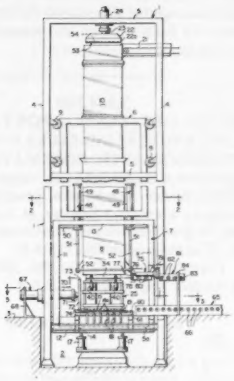
3,824,758

METHOD AND APPARATUS FOR PACKING COMPRESSIBLE MATERIAL SUCH AS TOBACCO

Joel C. Hart, Richmond, Va., and Charles W. Traughber, Jr., Candler, N.C., assignors to British-American Tobacco Co., Ltd., London, England and Fisburne International, Inc., Asheville, N.C.

Filed May 10, 1973, Ser. No. 358,952
Int. Cl. B65b *13/20, 63/02*
U.S. Cl. 53—24 **10 Claims**

Material such as leaf or strip tobacco is compressed between bale boards in a compression chamber, compression being carried out by a press ram engaging one of the boards and with pressure adequate to compress the material to a smaller mass than is ultimately to be obtained. The means defining the compression chamber is removed and the press ram is then backed off a predetermined small distance, allowing the compressed mass to expand toward the desired final size. Before the compressed mass has expanded adequately to cause excessive friction between the ram and the bale board it engages, the combination of the compressed mass and the bale boards is pushed laterally, away from the press ram, and is then retained by rollers engaging the bale boards while strapping is applied.



3,824,759

METHOD AND APPARATUS FOR HANDLING STACKABLE BODIES

Lawrence R. Finn, and Richard L. Smith, both of Toledo, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 18, 1973, Ser. No. 324,615
Int. Cl. B65b *63/02*
U.S. Cl. 53—24 **21 Claims**

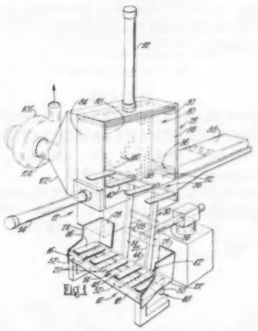


Fig. 1

A method and apparatus are provided for handling compressible batts of glass fiber insulation. The batts are sequentially removed from a conveyor line and stacked on one another at a loading or stacking station to a predetermined number or height. The stack of batts is moved away from the point of stacking and compressed by a bat compressing and carrying unit, and additional compressible batts are sequen-

tially removed from the conveyor line and stacked at the stacking station. The second stack of batts is then compressed adjacent the first stack by the unit and the two stacks moved together by the unit from the stacking station to a packaging station. Suction is applied to the two stacks of batts at the packaging station while fingers of the batt compressing and carrying unit, which fingers supply the compressive forces on the batts, are moved apart and retracted. The two stacks of batts are then packaged at the second station while additional batts are removed from the line and stacked at the stacking station for the next package.

3,824,760

METHOD AND INSTALLATION FOR FABRICATING, FILLING AND SEALING SACKS MADE FROM THERMOPLASTIC HOSE MATERIAL

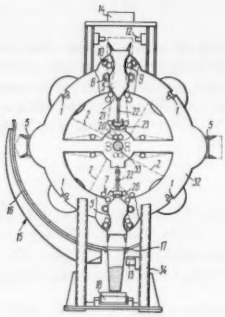
Anatoly Afanasievich Sinichenko, ul. Gagarina, 54, kv. 24; Anatoly Mikhailovich Romanenko, prospekt Kosmonavtov, 7, kv. 3; Evgeny Alexeevich Sukhov, ul. Lisichanskaya, 55a, kv. 30, and Grigory Fedorovich Markovsky, ul. Donetskaya, 52, kv. 53, all of Severodonetsk, U.S.S.R.

Filed Oct. 24, 1972, Ser. No. 300,363

Claims priority, application U.S.S.R., Oct. 25, 1971, 1708087

Int. Cl. B65b *9/14, 43/00*

U.S. Cl. 53—29 **7 Claims**



A method of fabricating, filling and sealing sacks made of thermoplastic hose material and an installation for accomplishing same are intended for packaging bulk and loose products. The method and the installation are simple, and reliable in operation.

3,824,761

METHOD OF MANUFACTURE OF CROWN CLOSURES FROM THERMOPLASTIC MATERIAL

Harold B. Wright, McLean, Va., assignor to Shenandoah Plastics Corporation, Frederick, Md.

Division of Ser. No. 34,147, May 4, 1970, abandoned. This application Sept. 11, 1972, Ser. No. 287,847

Int. Cl. B65b *7/28;* **B67b** *1/02*

U.S. Cl. 53—41 **6 Claims**

A crown for bottles and method for continuous manufacture of the crown from thermoplastic sheet material. The crown has a shaped undersurface conformed to the mouth of bottles as an aid in sealing.

3,824,762

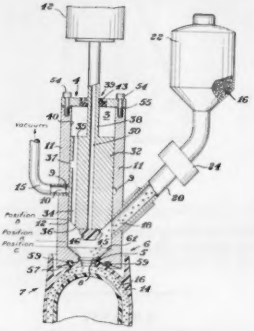
APPARATUS FOR FILLING AND HERMETICALLY SEALING THERMOPLASTIC CONTAINERS UNDER VACUUM

Wilhelm E. Walles, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 30, 1973, Ser. No. 346,444

Int. Cl. B65b *31/02*

U.S. Cl. 53—88 **5 Claims**



Thermoplastic containers are filled with materials such as particulate solids or liquids under vacuum and hermetically sealed in rapid succession by an apparatus having means for evacuating the container, means for filling and hermetically sealing the evacuated containers while retaining the vacuum.

3,824,763

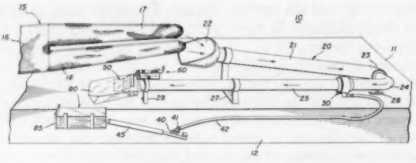
PNEUMATIC PACKAGE LOADER

George E. Lewis, Fayetteville, Ark., assignor to Bear Brand Hosiery Co., Chicago, Ill.

Filed Jan. 26, 1973, Ser. No. 327,002

Int. Cl. B65b *1/04, 1/00*

U.S. Cl. 53—255 **16 Claims**

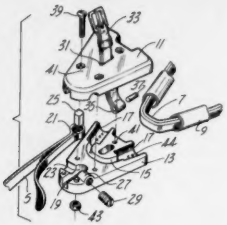


Packaging apparatus for garments such as panty hose includes a cylindrical conduit having an entry end and an exit end, and a Venturi air chest on the conduit for establishing a stream of air in the conduit to draw the garment into the conduit at the entry end and eject it into a bag or other container at the exit end. A funnel-shaped nozzle on the exit end of the conduit has an outer sleeve portion spaced radially outwardly from the conduit and cooperating with a clamping device for holding the open end of the bag in surrounding relationship with the conduit and spaced therefrom, perforations in the cone-shaped part of the nozzle permitting free flow of the air stream from the bag.

3,824,764
HOBBLE

Donald H. Roberts, 500 Lockwood Rd., Ortonville, Mich. 48462

Filed May 30, 1973, Ser. No. 365,343
Int. Cl. B68b 1/00
U.S. Cl. 54—71 7 Claims

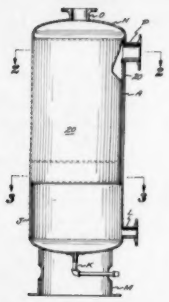


A hobble for pacer horses has front and rear leg loops connected to intermediate straps whose length is adjustable. The connection between the loops and intermediate strap is a two piece connector having loop receiving recesses that include the leg loop and a second loop formed by the strap being folded back over itself and around a non-circular member. A lock means prevents movement of the second loop relative to the connector. A shield member encloses the leg loop and terminates at its ends within the connector.

3,824,765
GAS AND LIQUID SEPARATOR

Rodney A. Williams, Los Alamitos, Calif., assignor to J. A. Campbell Company, Long Beach, Calif.

Filed July 24, 1973, Ser. No. 382,207
Int. Cl. B01d 45/12
U.S. Cl. 55—1 5 Claims

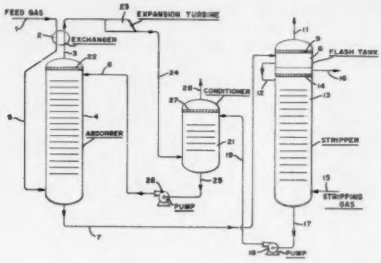


An improved apparatus for separating entrained liquid from a stream of gas by sequentially subjecting the stream to centrifugal action in first one direction and then in a second opposite direction, and the entrained liquid collecting on multiple screens as a result thereof. The separated liquid drains downwardly on the screen by gravity to a quiescent zone where it is free to flow to a settling tank, with the liquid after entering the tank stratifying into layers of oil and water that may be selectively removed from the tank by first and second valve outlets. The separated liquid when in the quiescent zone is substantially free from the action of the flowing stream as the latter flows through first and second annulus shaped spaces. The gas substantially free from entrained liquid flows upwardly from the apparatus to a desired destination.

3,824,766
GAS PURIFICATION

John P. Valentine, Belle Mead, and Wilbert E. Luley, Mendham, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed May 10, 1973, Ser. No. 359,032
Int. Cl. B01d 53/14
U.S. Cl. 55—48 12 Claims

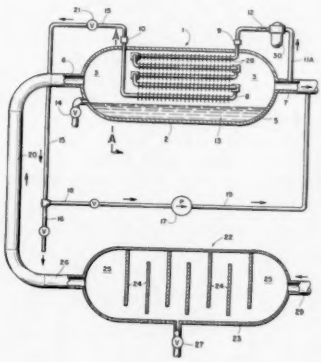


"Adiabatic" process for purification of a gas mixture containing principally methane together with carbon dioxide and minor amounts of hydrogen sulfide to remove substantially all the hydrogen sulfide while retaining most of the carbon dioxide in the gas mixture by means of a solvent medium comprising a normally liquid dialkyl ether of a polyalkylene glycol which has been cooled and saturated with carbon dioxide by direct contact with let-down pressure purified gas.

3,824,767
DEMISTOR

Reginald G. Ford, Tulsa, Okla., assignor to Cities Service Oil Company, Tulsa, Okla.

Filed May 17, 1973, Ser. No. 361,091
Int. Cl. B01d 5/00; C07c 9/00
U.S. Cl. 55—20 10 Claims



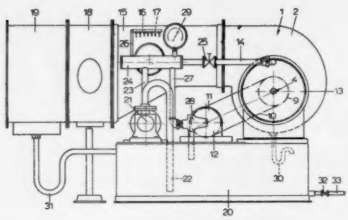
Demisting of a flowing gas stream under superatmospheric pressure is facilitated by chilling the gas in a liquid separation zone by means of a heat exchanger. To provide a cooling fluid which is circulated through the exchanger, part of the superatmospheric gas stream from the liquid separation zone is passed through a flow restricting orifice and then into the exchanger while the interior of the latter is maintained at a substantially lower pressure than that which exists upstream of the orifice, hence effecting cooling of the gas by the rapid ex-

pansion thereof. Accordingly, a portion of the gas that is demisted is then used as a coolant in the demisting process and as a consequence thereof no extraneous refrigerant or refrigerating equipment is required.

3,824,768
APPARATUS FOR PURIFYING A GAS

Alfred Erich Wibrandt Van Diepenbroek, Ermelo, Netherlands, assignor to Bronswerk-Apparatenbouw N.V., v/h Moring & Steenaart, Nijkerk, Netherlands

Filed July 21, 1972, Ser. No. 273,956
Claims priority, application Netherlands, July 26, 1971, 7110254
Int. Cl. B01d *47/06*
U.S. Cl. 55—223 **3 Claims**

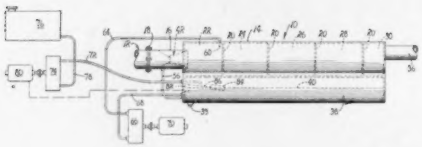


Apparatus for purifying a gas, in particular air. A liquid, in particular water, is converted into a liquid mist by means of an atomizer. The gas to be purified is intimately contacted with this liquid mist whereby the impurities are transferred, at least for a major part, from the gas into the liquid mist. Hereafter the gas is contacted, together with the liquid mist containing the impurities, with liquid particles large with respect to the mist particles and adapted to combine with the liquid mist containing the impurities. Then the purified gas is separated from the liquid.

3,824,769
DEVICE FOR REMOVING NOXIOUS MATTER FROM EXHAUST GASES

Anthony R. Santos; Ontario R. Santos, and Gerald Dean Allen, all of 3298 Avenue 192, Tulare, Calif.

Filed Oct. 10, 1972, Ser. No. 295,963
Int. Cl. B01d *47/06*
U.S. Cl. 55—223 **1 Claim**

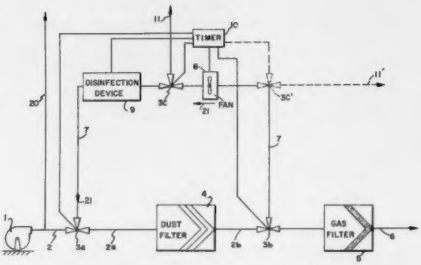


A device for removing noxious matter from a stream of exhaust gases as the stream is projected from an exhaust conduit. The invention is characterized by a tubular chamber which receives the exhaust gas, a water bath for washing and cooling the gas, and a circulating system including a sump located beneath the chamber for collecting granulated water and a circuit for returning water from the sump to the water bath.

3,824,770
FILTERING DEVICE FOR REMOVING BACTERIA FROM THE VENTILATION AIR

Wolfgang Eckstein, Dorfstrasse 70, 2406 Sereetz, Germany

Filed July 2, 1973, Ser. No. 375,874
Claims priority, application Germany, July 6, 1972, 2233215
Int. Cl. B01d *31/00*
U.S. Cl. 55—279 **9 Claims**

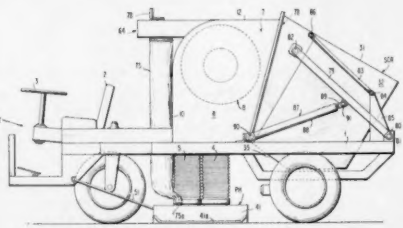


An air filtering device mounted in a ventilation system and provided to remove bacteria from the air current supplied into rooms to be held under sterile conditions comprises a suspension filter located in the air supply conduit and adapted to be shut off and connected into an air conducting disinfection circuit including a device furnishing a disinfectant in suspension and a fan circulating the air with the entrained disinfectant through the suspension filter. In the preferred embodiment, the disinfection circuit is branched to the ventilation air supply conduit upstream and downstream of the suspension filter by means of three-way control valves and the disinfection circuit comprises a vent permitting a flush air current pressed or sucked through the suspension filter and expelling the disinfectant after disinfection to escape. An electrical timing device or circuit controls the valves, the vent and the fan so that either only the filtered air is supplied, or only the disinfection of the suspension filter takes place, or only the suspension filter is passed through by a flush air current.

3,824,771
GAS AND PARTICULATE SOLID MATERIAL SEPARATING AND SOLID MATERIAL DISCHARGING APPARATUS

John K. Williams, Waco, Tex., assignor to Central Texas Iron Works, Inc., Waco, Tex.

Division of Ser. No. 193,514, Oct. 28, 1971, Pat. No. 3,755,851. This application May 22, 1973, Ser. No. 362,685
Int. Cl. B01d *50/00*
U.S. Cl. 55—429 **8 Claims**



Apparatus for separating particulate solid material from a stream of gas, such as air, entraining such material includes a blower, a solids collection receptacle, ducting connected to

the blower and to the receptacle and communicating with a source of gas with entrained particulate solid material, the blower, receptacle and ducting providing a substantially closed system in which gas is recirculated, the solid material being separated from the circulating gas and deposited in the collection receptacle. A portion of the circulating gas, usually not exceeding 30 percent by volume, is bled from the circulatory system and discharged to maintain the average pressure in the circulating system at a desired low value so as to prevent leakage blow-out of gas and entrained dust or fine solids. Means for bleeding gas off from the system is situated within structure housing the blower and a separation chamber. The solids collecting receptacle is mounted so as to be bodily movable away from the blower and ducting housing structure and so as to respond to such bodily movement by tipping to dump accumulated solids. The gas cleaning apparatus is disclosed in connection with mobile surface sweeping equipment including a pick-up head having means for regulating the flow of air from a pressure chamber against the surface being cleaned and into a suction chamber in the pick-up head.

3,824,772

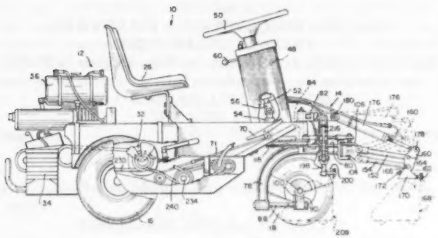
TURF MAINTENANCE MACHINE

Charles E. Sorenson, Mount Vernon; Clyde D. Stubblefield; Arnold A. DeBaillie, both of Evansville, all of Ind.; Robert K. Bramley, Cleveland, and Hugh A. Bourassa, University Heights, both of Ohio, assignors to Hahn, Inc., Evansville, Ind.

Division of Ser. No. 220,629, Jan. 25, 1972, Pat. No. 3,771,296. This application Feb. 26, 1973, Ser. No. 335,548

Int. Cl. A01d *75/30*

U.S. Cl. 56—7 **2 Claims**



A turf maintenance machine comprising a vehicle with a plurality of reels connected to the vehicle. Each reel includes a front support roller and rear support roller between which the usual rotary blade and knife bar are disposed, and an additional rear support roller which is mounted for movement between a lower ground engaging position and an upper position. When the additional roller is in its lower position, the first said rear roller is raised above the ground to raise the knife bar. A rotary brush is provided for cleaning the first said rear roller during the cutting operation. Each reel is connected to the vehicle by a support member with the connection between the reel and the support member providing for pivotal movement of the reel relative to the support member about an axis parallel to the axis of its said front roller. Each support member is then connected to the vehicle for pivotal movement about an axis perpendicular to the axis of the front roller of its associated reel.

3,824,773

AUTOMATIC RAKE

Harry E. Brubaker, 560 E. Lawn, Urbana, Ohio 43078

Filed Aug. 21, 1972, Ser. No. 282,027

Int. Cl. A01d *81/00*

U.S. Cl. 56—369 **1 Claim**

A rake for raking a lawn or other grounds, the device consisting of frame supported upon wheels so that it can travel across the ground, a control handle extending rearwardly upwardly from the frame for being held by an operator walking behind, the device being powered either by a gasoline engine

or electric battery and including a series of individual hand type rakes operated by a crank shaft so as to move through a raking motion of the ground.

3,824,774

METHOD AND APPARATUS FOR THE FABRICATION OF CONDENSER YARNS

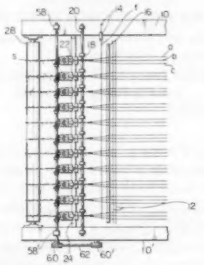
Yasushi Kobayashi, Tokyo, Japan, assignor to Nissan Motor Company, Yokohama City, Japan

Filed Oct. 24, 1972, Ser. No. 300,253

Claims priority, application Japan, Oct. 25, 1971, 46-84482

Int. Cl. D03d *41/00*; **D02g** *3/42*

U.S. Cl. 57—24 **9 Claims**



A method and an apparatus for concurrently fabricating a number of condenser yarns having two or more wadder filaments twisted upon each other and twiner elements which are twined between and around the wadder filaments. The wadder filaments fed in a number of groups are shed and receive a twiner filament in shed in manners similar to the feeding of warps and wefts in a usual loom. Upon beating of the twiner filament onto the wadder filaments, the twiner filament is cut to a number of twiner elements which are allocated respectively to the individual groups of the wadder filaments. The wadder filaments thus carrying the twiner elements are then twisted upon each other so that the twiner elements are twined between and around the wadder filaments thus spun.

3,824,775

METHOD OF AND APPARATUS FOR STRANDING ELONGATE MATERIAL

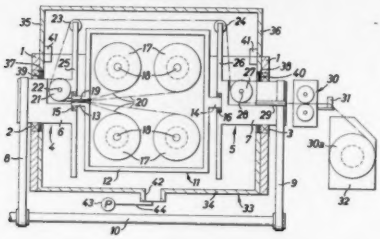
Norman John Birch, Wordsley, England, assignor to National-Standard Company Limited, Worcestershire, England

Filed Aug. 24, 1972, Ser. No. 283,558

Claims priority, application Great Britain, Aug. 26, 1971, 40070/71

Int. Cl. D07b 3/12

U.S. Cl. 57—58.52 4 Claims



In a machine for stranding elongate material for example metallic wire, comprising a first support means for receiving spools of the material to be stranded, a rotary twisting component, and a second support means for receiving a take-up spool for the stranded product, said rotary twisting component is disposed within an enclosure, means is provided for creating at least a partial vacuum within the enclosure, and sealing means is mounted in a wall of said enclosure through which the stranded product leaving the rotary twisting component is led to the take-up spool. Said first support means may also be disposed within said enclosure.

3,824,776

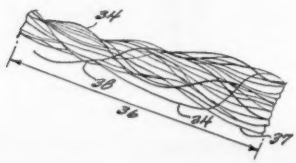
FABRIC HAVING IMPROVED PICK RESISTANCE

Joe F. London, Jr., Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Jan. 11, 1972, Ser. No. 217,060

Int. Cl. D02g 3/34, 1/02, 1/16

U.S. Cl. 57—140 J 6 Claims



A fabric is provided of improved pick resistance containing a textured, air jet interlaced yarn comprising a plurality of continuous synthetic thermoplastic filaments. The yarn is further characterized by uniform repeating sections of about ⅛–1 inch in length, each said section being composed of a relatively open bulky and lofty portion of false twisted multifilaments and a relatively short node portion where the multifilaments are closer together and are interlaced and encircled.

3,824,777

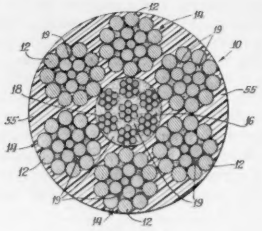
LUBRICATED PLASTIC IMPREGNATED WIRE ROPE

Peter Philip Riggs, Essex, England, assignor to Amsted Industries Incorporated, Chicago, Ill.

Filed Oct. 5, 1973, Ser. No. 403,797

Int. Cl. D07b 1/16, 7/12, 7/14

U.S. Cl. 57—149 7 Claims



A wire rope, and method of making same, is provided wherein the wire rope strands are coated with a heavy viscous lubricant prior to winding the strands into rope, and the lubricated rope is impregnated with a thermoplastic material to entrap the lubricant in the strands and core. The outer strands are held in spaced relationship during the plastic impregnating step, and the plastic material does not extend beyond the outer periphery of the wire rope.

3,824,778

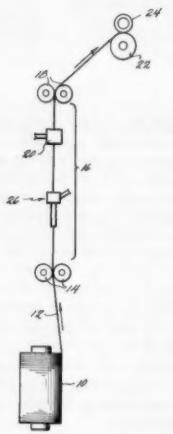
HEATING PROCEDURE IN A FALSE TWIST TEXTURIZING PROCESS

Harry E. Flanders, Jr., Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Sept. 25, 1972, Ser. No. 291,585

Int. Cl. D02g 1/02

U.S. Cl. 57—157 TS 10 Claims



An improved heating procedure in a yarn texturizing process by heat setting a false twist therein which comprises confining a sonic flow of superheated steam in closely adjacent surrounding relation along a predetermined longitudinal extent of the yarn continuously moving between the upstream position of twist restraint and the position at which the false twist is imparted to the yarn. The procedure makes possi-

ble the texturizing of yarn at production rates of 275 ypm utilizing a steam source at a temperature of 470°F and pressure of 55 psig with a sonic flow confining surface of approximately 6 inches in length and 0.083 inches in diameter.

3,824,779

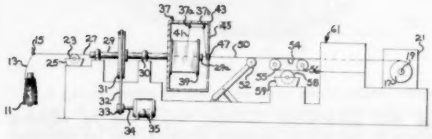
METHOD OF MAKING MULTIFILAMENT YARNS

Alfred Marzocchi, Cumberland, R.I., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 721,688, April 16, 1968, Pat. No. 3,620,280. This application June 4, 1971, Ser. No. 150,113

Int. Cl. B65h *81/08*; D02g *3/38*, *3/48*

U.S. Cl. 57—162 **7 Claims**



Organic and glass filaments, yarns and/or strands are combined, with the organic component as the core and the glass component as the overwrap, followed by a treatment which causes the organic to shrink, causing spaced portions of the glass component to move or to tend to move radially outwardly with respect to the longitudinal axis of the combined structure and whereby, when the combined structure is in an elastomeric matrix, the region of the matrix contiguous to the organic component is in a state of compression while the glass component exhibits greater anchoring potential with the elastomeric matrix.

3,824,780

SYSTEM FOR REGULATING ROTARY SPEED OF A SHAFT

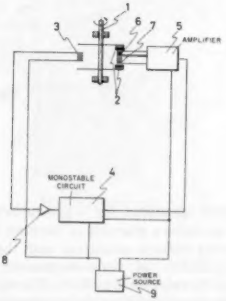
Jose Gracia Barba, 560 E. Lawn Guillermo 39, 40, Barcelona, Spain

Filed June 15, 1972, Ser. No. 263,275

Claims priority, application Spain, June 15, 1971, 392242

Int. Cl. G04c *3/04*

U.S. Cl. 58—23 D **5 Claims**



A pick-up attached to the shaft whose movement is to be regulated picks up a signal periodically produced by the shaft itself during its rotation. The signal triggers an electronic circuit which emits a stable signal of constant duration which acts on the pulsing system of the shaft.

3,824,781

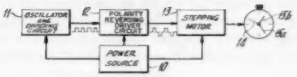
HOROLOGICAL MOVEMENT EMPLOYING INDUCTIVE STEPPING MOTOR

Gunther Rudolph Diersbock, Watertown, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Mar. 14, 1973, Ser. No. 341,017

Int. Cl. G04c *3/00*

U.S. Cl. 58—23 R **3 Claims**



An electronic watch utilizes an alternating current unidirectional induction stepping motor for electromechanical conversion. The motor is driven step-wise by an oscillator, a frequency-reducing divide circuit and a polarity reversing driver circuit. The stepping motor includes a rotor having a multipole upper disk, a multishoe bottom disk, and an axially magnetized cylindrical magnet separating and magnetizing the two multishoe disk. The stator has pole portions cooperating with both upper and lower disks.

3,824,782

CORRECTION SWITCHING DEVICE OF WRIST WATCH WITH ELECTRONIC BUZZER

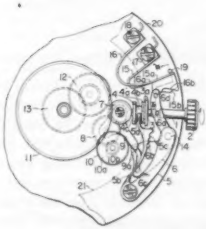
Yoshio Iinuma, Hino, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1973, Ser. No. 335,277

Claims priority, application Japan, Feb. 25, 1972, 47-19550

Int. Cl. G04c *21/34*; G04b *23/12*, *27/02*

U.S. Cl. 58—38 **2 Claims**



A correction switching device for a wrist watch provided with an electronic buzzer, comprising a stem having at least three stable positions, and a setting mechanism and an electronic buzzer switch which are operated by said stem such that said setting mechanism is set in a time setting position when said winding stem is in one of said three stable positions and in an alarm setting position when said stem is in one of the other stable positions, and said electronic buzzer switch is set in the "off" position when said stem is at least in one of the stable positions other than that for time setting and in the "on" position when said stem is in the other stable positions.

3,824,783

MANUALLY OPERABLE PIVOT PIN FOR A WRIST WATCH BAND

Clarence S. Nadeau, 175 Greenfield St., Seekonk, Mass. 02771

Filed July 5, 1973, Ser. No. 376,615

Int. Cl. G04b *37/00*; C01d *7/18*

U.S. Cl. 58—88 SC **3 Claims**

A manually operable pin for a wrist watch band comprising a pair of hollow, tubular members in telescopic relation. The members have extending pintles at their outer ends for engag-

ing the watch bail openings. The inner member has a longitudinal slot spaced from the inner end. The outer member has a manually engageable tab extending upwardly adjacent its inner end. Spaced from the tab, a portion of the body extends inwardly into the slot on the inner member to permit relative telescopic movement within the limits of the slot. A coil spring is mounted within the members to normally bias the members in extended position. To lock the pin to a watch bail after it

has been inserted in the end of a watch band, the pintle on the inner member is placed into one bail opening. The tab is manually moved against the action of the spring to shorten the pivot pin and allow the pintle on the outer member to be inserted in the other watch bail opening. The pivot pin is removable in the same manner, by manually engaging the tab and telescoping the members to shorten and remove the pin. No tool is necessary to insert or remove the pivot pin.

3,824,784

THRUST DEFLECTORS FOR DUCTED FAN GAS TURBINE ENGINES

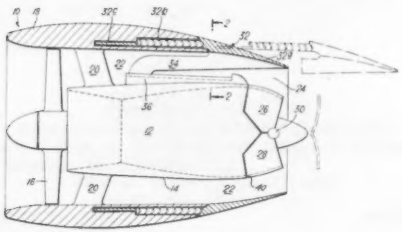
George Samuel Kitson, and Julian MacDonald Davison Sutton, both of Nottingham, England, assignors to The Secretary of State for Defence, London, England

Continuation of Ser. No. 75,621, Sept. 25, 1970, abandoned. This application June 30, 1972, Ser. No. 267,972

Claims priority, application Great Britain, Sept. 29, 1969, 47742/69

Int. Cl. F02c *3/06*; **F02k** *3/06*

U.S. Cl. 60—226 A **2 Claims**



A ducted fan gas turbine engine has thrust reverser doors mounted at the hot gas stream exhaust nozzle and a fan cowl downstream portion which is translatable. The thrust reverser doors deflect the hot gas stream radially outwards and the hot gas stream in turn, deflects the cold fan stream radially outwards through a gap found by translation of the fan cowl downstream portion in a downstream direction.

3,824,785

GAS TURBINE DUCTED FAN ENGINES

Marcel Robert Soligny, Chevilly-Larue, and Jean Georges Bouiller, Brunoy, both of France, assignors to Societe Nationale D'Etude Et De Construction De Moteurs D'Aviation, Paris, France

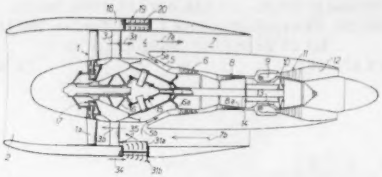
Filed Dec. 7, 1972, Ser. No. 313,110

Claims priority, application France, Dec. 7, 1971, 71.43865

Int. Cl. F02k *3/02*

U.S. Cl. 60—226 A **5 Claims**

A gas turbine ducted fan engine, comprising, at the front, a fan having reversible blades which normally discharge air into a discharge duct which is divided into an internal duct through which there passes a primary air flow which feeds the compressor of the engine and an external duct through which a secondary air flow passes from front to rear, and in order to ensure that the compressor is fed when the pitch of the vanes is reversed in order to obtain a braking effect, openings which are normally closed but which open into the region of the duct from which there diverge the two ducts and which are pro-



vided with guide-blade cascades which can be adjusted between an inoperative position, in which they are retracted into the external wall of the duct, and an operative position in which they project, on the one hand, on the outside of and, on the other hand, into the duct, in such a way as to scoop up air on the outside in order to discharge it into the said region of the duct.

3,824,786

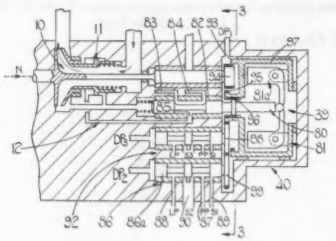
FUEL CONTROL APPARATUS FOR GAS TURBINE ENGINE

Robert Thomas John Skinner, High Wycombe, England, assignor to Lucas Aerospace Limited, Birmingham, England

Filed Sept. 25, 1972, Ser. No. 291,604

Int. Cl. F02k *3/08*

U.S. Cl. 60—243 **31 Claims**



A fuel control apparatus for a gas turbine engine reheat system which includes a plurality of burners has a plurality of variable metering orifices associated with the respective burners and a plurality of servo-responsive throttle valves downstream of the respective orifices. The apparatus includes an arrangement for controlling the servo pressures applied to the throttle valves, this arrangement including a governer driven by the engine and mounted on an internal ring gear. A first valve spool is coupled to the ring gear and is axially movable by the governer. The ring gear includes a coaxial spur gear which meshes with further spur gears forming parts of respective valve spools which control the servo pressures for associated throttle valves.

3,824,787

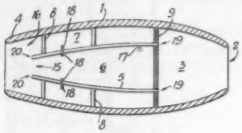
INTERMITTENT COMBUSTION DEVICE WITH A PAIR OF COEXTENSIVE AND COAXIAL MUTUALLY INDUCTIVE CHAMBERS

Alexander Hossen Etessam, 91 Eldorado Ave., Shemiran, Tehran, Iran

Continuation of Ser. No. 55,379, July 16, 1970, abandoned. This application Sept. 20, 1972, Ser. No. 290,740

Int. Cl. F02k 7/04

U.S. Cl. 60—248 17 Claims



A gas generator for a turbine or jet power plant comprising a pair of coextensive combustion chambers normally coaxially arranged between the inlet and outlet and each operating on the pulse jet principle, the combustion chambers converging towards the outlet in the form of mutually inductive nozzles so that the combustion chambers operate in an alternate cycle providing continuous throughput of air from inlet to outlet. Embodiments include power plants incorporating the combustion chambers and suitable for stationary purposes such as road vehicles, subsonic aircraft and supersonic aircraft, turbine and bypass engines.

3,824,788

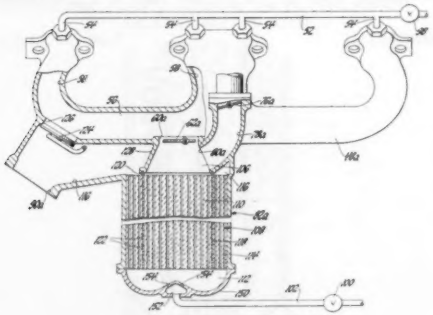
INTERNAL COMBUSTION ENGINE AND METHOD OF OPERATION FOR EXHAUST EMISSION CONTROL

Edward N. Cole, Bloomfield Hills, and George W. Niepoth, Milford, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 247,569, April 26, 1972, abandoned. This application Dec. 6, 1972, Ser. No. 312,574

Int. Cl. F02b 75/10; F01n 3/14

U.S. Cl. 60—274 21 Claims



A V-8 internal combustion engine with an inlet manifold disposed between the banks of cylinders and a pair of exhaust manifolds disposed outboard of the banks of cylinders has a converter unit containing reducing and oxidizing catalyst beds coupled to each exhaust manifold. During a warm-up mode, exhaust gases from both banks of cylinders pass through a heat exchange region beneath the inlet manifold and then enter the conveyor units and pass through the catalyst beds. Air injected at the exhaust ports during the warm-up mode supports oxidation of hydrocarbons and carbon monoxide, and the hot exhaust gases promote evaporation of fuel in the inlet manifold and heat the catalyst beds. After the warm-up mode, a converter mode is entered in which exhaust gases are discharged from the exhaust manifolds directly into the converter units and pass through the catalyst beds. A reducing atmosphere provided in the first catalyst bed during the converter mode supports dissociation of oxides of nitrogen, and air injected between the catalyst beds provides an oxidizing atmosphere to support oxidization of hydrocarbons and carbon monoxide in the second catalyst bed. At high speeds or temperatures, a reactor mode is entered in which air injected at the exhaust ports supports oxidation of hydrocarbons and carbon monoxide in the exhaust manifolds and the exhaust gases then are discharged from the exhaust manifolds directly to the exhaust pipes to protect the catalyst beds.

3,824,789

BATTERY-OPERATED MINIATURE ALARM CLOCK

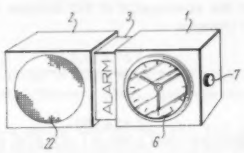
Werner Muller, and Paul Schmalz, both of Schwenningen, Germany, assignors to Muller-Schlenker, Schwenningen, Germany

Filed Feb. 8, 1973, Ser. No. 330,617

Claims priority, application Germany, Feb. 18, 1972, 2207690

Int. Cl. G04c 21/28

U.S. Cl. 58—19 R 14 Claims



The present invention relates to a miniature alarm clock wherein a movement and an electric alarm are jointly disposed in a case comprised of two parts whose ends are telescoped into each other and which may be adjusted relative to each other between two different positions. One of said parts of the case contains the movement and a battery which feeds the alarm while the other part contains the alarm. The said two parts of the case are provided with contacts located in the electric circuit of the alarm which interrupt the circuit in the first of the two positions of said parts of the case and close the circuit in the second position of said parts of the case so that the alarm is only operative in the second position of said parts of the case.

3,824,790

CATALYTIC EXHAUST PURIFIER FOR DIESEL ENGINES

Lazarus Thomaides, c/o Granlin Corp., Progress Dr., East Cleveland, Ohio 18936

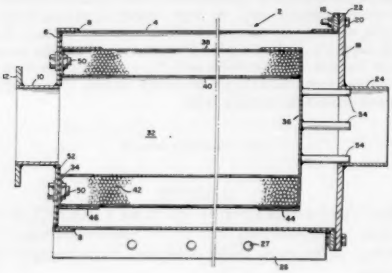
Filed Mar. 14, 1973, Ser. No. 341,122

Int. Cl. F01n 3/14

U.S. Cl. 60—299 1 Claim

A catalytic exhaust purifier for diesel engines has a housing with means forming an inlet opening substantially centrally in one end of the housing and means forming an outlet opening substantially centrally in the other end of the housing. Within the housing there is a hollow cylindrical catalyst bed having a pair of opposed end walls, inner and outer spaced cylindrical grids secured to said end walls and oxidation catalyst pellets

disposed between said grids. One bed end wall is secured to the inlet end of the housing and has a central opening communicating with the inlet opening in the housing. The other bed end wall is spaced from the other end of the housing and the outer cylindrical grid is spaced from the interior of the housing to provide a path for the flow of gas from the outer grid to the



outlet opening of the housing. Support members spaced to provide for the passage of gas are fixedly secured to the bed end wall adjacent the outlet opening in the housing and slidably engage the means forming said outlet opening to support the catalyst bed and accommodate the longitudinal expansion and the contraction of the catalyst bed incident to temperature changes.

3,824,791

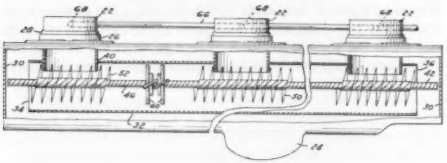
METHOD OF AND APPARATUS FOR BURNING INTERNAL COMBUSTION ENGINE EXHAUST GASES

Herbert R. Beller, Mount Clemens, Mich., and George R. Onufer, Tulsa, Okla., assignors to Russell, Burdsall & Ward, Inc., Port Chester, N.Y., by said Onufer

Filed Apr. 14, 1972, Ser. No. 243,986

Int. Cl. F01n *3/14*

U.S. Cl. 60—303 **7 Claims**



A method of and apparatus for substantially completely burning the unburned "heavy ends" of the hydrocarbon gases emanating from internal combustion engines comprising a tubular member disposed axially within the engine exhaust manifold in spaced-apart relation with the manifold walls, and one or more brush-like members disposed within the tubular member including a helically twisted core of relatively stiff wire having a multitude of relatively fine wire bristles possessing high heat retention and corrosion resistance projecting generally radially in random array from the core, and means for supporting the brush-like member within the tubular member with the distal ends of the bristles spaced from, but in close proximity to, the tubular walls.

3,824,792

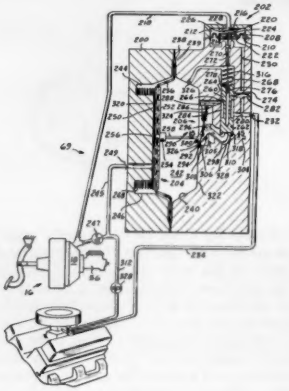
VACUUM INTENSIFIED BRAKE BOOSTER SYSTEM

Frederick G. Grabb, and Mark E. Beck, both of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Division of Ser. No. 143,419, May 14, 1971, Pat. No. 3,754,841. This application Oct. 2, 1972, Ser. No. 294,145

Int. Cl. F04b *43/06*

U.S. Cl. 60—411 **6 Claims**



An apparatus for sensing the available vacuum in a power braking system having the ability to generate an additional source of vacuum which can be combined with the vacuum in the system to maintain the vacuum in the system within a predetermined range.

3,824,793

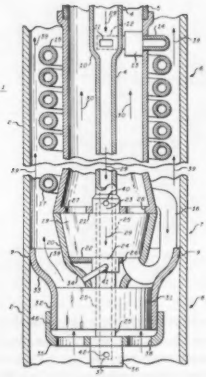
GEOTHERMAL ENERGY SYSTEM AND METHOD

Hugh B. Matthews, Acton, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Oct. 24, 1972, Ser. No. 300,058

Int. Cl. F03g *7/00*; **F01k** *23/00*

U.S. Cl. 60—641 **18 Claims**



A geothermal energy transfer and utilization system makes use of thermal energy stored in hot solute-bearing well water to generate super-heated steam from an injected flow of clean water; the super-heated steam is then used for operating a tur-

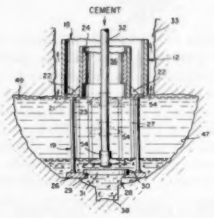
bine-driven pump at the well bottom for pumping the hot solute-bearing water at high pressure and in liquid state to the earth's surface, where it is used by transfer of its heat to a closed-loop boiler-turbine-alternator combination for the generation of electrical or other power. Cooled, clean water is regenerated by the surface-located system for re-injection into the deep well and residual concentrated solute-bearing water is pumped back into the earth.

3,824,794

OFFSHORE MARINE ANCHORING STRUCTURE

Laurence M. Hubby, Bellaire, Tex., assignor to Texaco Inc., New York, N.Y.

Division of Ser. No. 143,074, May 13, 1971, Pat. No. 3,745,776. This application Nov. 29, 1972, Ser. No. 310,632
Int. Cl. E02d *5/00, 5/40, 27/32*
U.S. Cl. 61—46 **3 Claims**



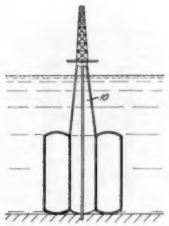
An apparatus for achieving the anchoring of an offshore marine platform having downwardly extending foundation legs. One or more legs are provided with a reinforcing cage at the lower end thereof adapted to be immersed in a cement anchoring block whereby to firmly position the platform.

3,824,795

PLATFORM STRUCTURE

Olva Mo, Gronsundveien 94, Nesbru, 1370-Asker, Norway

Filed Mar. 8, 1972, Ser. No. 232,665
Claims priority, application Norway, Sept. 7, 1971, 3325/71; Mar. 16, 1971, 3326/71; Nov. 19, 1971, 4282/71
Int. Cl. E02d *17/00, 27/38*
U.S. Cl. 61—46.5 **10 Claims**



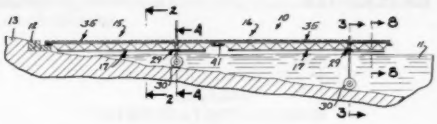
An offshore drilling platform includes a massive and heavy caisson surmounted by a lightweight superstructure. The center of buoyancy is above the center of gravity of the platform and the platform can be floated in upright position to a desired location and sunk by introducing ballast, such as sea water, into the caisson. the platform rests on the sea floor and is stable due to its own weight while the lightweight superstructure extends above the sea surface. A drilling platform is provided in fixed position on the superstructure above sea level.

3,824,796

MOBILE DOCK STRUCTURE

Charles L. Nasby, Jr., 4624 Bruce Ave. So., Minneapolis, Minn. 55424

Filed Nov. 3, 1972, Ser. No. 303,606
Int. Cl. E02b *3/20*
U.S. Cl. 61—48 **6 Claims**



A pair of longitudinally extended bar joists connected together in a generally parallel relationship have a wheel-equipped frame mounted spaced from one end thereof for adjustment of the wheels toward and away from the bar joists. A plurality of deck members are secured to the bar joists by nut-equipped bolts which pass through the deck members and selected ones of a plurality of longitudinally extended slots formed in each of the bar joists at spaced intervals longitudinally of the bar joists.

3,824,797

EVACUATED TUBE WATER HAMMER PILE DRIVING

Serge S. Wisotsky, Sharon, Mass., assignor to Orb, Inc., Marion, Ohio

Continuation-in-part of Ser. No. 163,422, July 16, 1971, abandoned. This application June 30, 1972, Ser. No. 267,753
Int. Cl. E02d *7/10;* **G01v** *1/38*
U.S. Cl. 61—53.5 **34 Claims**

Driving long piles into submerged lands with a liquid ram or spear generated in an evacuated tube. Various drivers are enclosed. In one embodiment, the pile itself is used as at least a portion of the working chamber for generating water hammer.

3,824,798

SUBMARINE CABLE-BURYING DEVICES

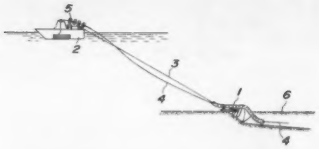
Kaisuke Shiroyama, Yokohama, and Takeo Yokoyama, Kamakura, both of Japan, assignors to The Furukawa Company Limited, Tokyo, Japan

Filed June 7, 1972, Ser. No. 260,430

Claims priority, application Japan, Nov. 15, 1971, 46-90661; Nov. 15, 1971, 46-90662; May 8, 1972, 47-53340

Int. Cl. E02f *5/02*; **F16l** *1/00*

U.S. Cl. 61—72.4 **8 Claims**



A plow-type cable-burying device for use in placing communication and power transmission cables under ground under a body of water has a protective blade, cultivating blades and a plow-type digging blade arranged in succession in the order as mentioned along a tubular body for guiding a cable to be buried in the ground under water. The tubular body is stabilized by sledges and the cable is further guided by a plurality of cable guide cylinders.

3,824,799

WASH OF ICE CRYSTALS

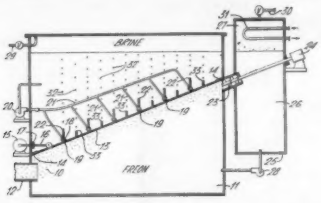
Neophytos Ganiaris, Riverdale, N.Y., assignor to Struthers Patent Corporation

Filed Apr. 30, 1973, Ser. No. 355,688

Claims priority, application Great Britain, May 1, 1972, 020156/72

Int. Cl. B01d *9/04*

U.S. Cl. 62—123 **10 Claims**



Ice crystals formed in a solution, such as in the ice crystallization conversion of sea water to fresh water, are washed in organic liquid, such as Freon, at a temperature below 32° F. The ice crystals float upward in the Freon to be restrained by an upward sloping screen. The ice crystals are agitated in the liquid Freon by vibration of the screen and/or by jets of liquid Freon directed downward through the screen. Brine, which is thus mechanically washed from the crystals, floats upward through the screen to be collected above it. Washed ice crystals move up the screen to be collected, melted, and have the Freon separated from the fresh melt water.

3,824,800

AIR CONDITIONING UNIT AND CONTROL

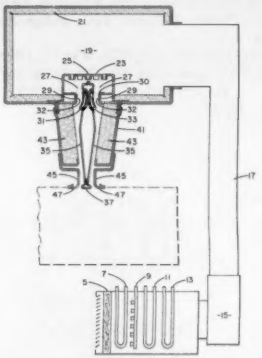
Richard A. Church, North Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Sept. 7, 1973, Ser. No. 395,081

Int. Cl. F25d *17/04*

U.S. Cl. 62—186 **10 Claims**

An air conditioning unit for supplying conditioned air from a central station into a space to be conditioned to cool the space. The unit includes a device to regulate the quantity of air discharged therefrom. A pressure responsive valve is connected to the device and to the supply duct to provide a control signal to the device, the magnitude of the control signal varying with changes in pressure of the conditioned air in the supply duct to the unit. The unit further includes a thermostat for further varying the control signal supplied to the device, the magnitude of the control signal being varied in accordance with changes of the temperature in the area being conditioned. A suitable control has a normally open port through



which conditioned air passes from the supply duct to the pressure responsive valve, and a normally closed port communicating with the thermostat. The normally closed port is opened when the temperature of the conditioned air supplied from the central station exceeds a predetermined value to pass the relatively warm air through the port to the thermostat, the magnitude of the control signal thereafter passing from the pressure responsive valve to the air regulating device being determined solely by the pressure of the conditioned air in the supply duct.

3,824,801

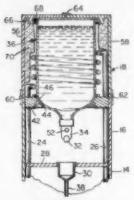
WATER COOLER

Gaetano J. Laudato, Jr., 2 Lamartine Pl., Jamaica Plain, Mass. 02130

Filed Feb. 12, 1973, Ser. No. 331,961

Int. Cl. F25d *17/02*

U.S. Cl. 62—201 **4 Claims**



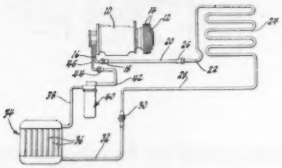
A water cooler is provided for use with bottled drinking water. Each bottle is provided with an inverted valve cap so that the water is released directly from the bottle to a cup or other container. The unit includes a housing having an upper chamber adapted to receive the bottle and support it in an inverted position. Cooling coils are mounted within the upper chamber for direct engagement with the bottle placed therein. A pressure-sensitive switch is located to engage the bottle and is kept closed by the weight of the filled bottle. When the bottle empties the switch opens to shut off the refrigeration system.

3,824,802

CONTROL MEANS FOR ACCUMULATOR THROTTLING DEVICE

Carl A. Scherer, Clarence Center, and Gary E. Richards, Lockport, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed July 11, 1973, Ser. No. 378,229
Int. Cl. F25b 41/04
U.S. Cl. 62—217 4 Claims



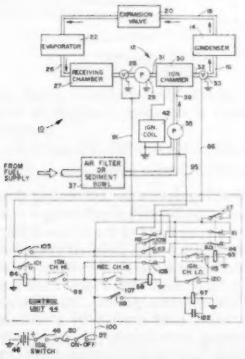
An improved evaporator temperature controller for use in an air conditioning system having a refrigerant compressor and an evaporator in series flow relationship to one another and including a liquid accumulator housing therebetween enclosing an interior space and having an inlet connected to the evaporator and an outlet connected to the compressor. A valve seat member is supported within the interior space with a valve passage therethrough separating the outlet portion of the housing from the interior space. A water filled freeze actuator is located in said interior space in good heat transfer relation to refrigerant therein and is operably connected to a throttling valve member to control refrigerant flow therefrom in accord with the 32° F freeze — expansion characteristics of the actuator. An oil pick-up tube which is in bypass relation to the throttling valve supplies the compressor with lubricating oil when the throttling valve is in a closed position and is placed in good heat transfer with the actuator to transfer heat from the actuator whenever the throttling valve is in a closed position whereby improved control of the evaporator temperature is achieved.

3,824,803

APPARATUS FOR REFRIGERATION SYSTEMS

Thomas C. Wright, 8476 W. 103rd Ter., Chicago, Ill. 60620, and Bernard L. Kleinke, 934 Willson Dr., Des Plaines, Ill. 60016

Filed July 3, 1972, Ser. No. 268,822
Int. Cl. F25b 1/00
U.S. Cl. 62—226 11 Claims



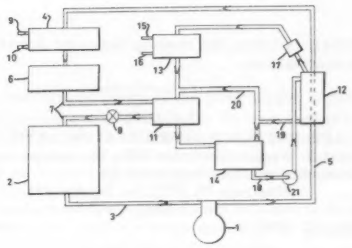
The refrigeration systems include a heating and pumping apparatus connected in a closed-loop configuration with a condenser, an expansion valve or capillary tube, and an evaporator. The heating and pumping apparatus includes a heating chamber in which a portion of the refrigerant in the closed-loop system is heated and pressurized, a valve for permitting the heated refrigerant to be conveyed from the heating chamber through the condensor and then through the other components in the closed loop, a receiving chamber for confining the refrigerant flowing from the evaporator, and transfer devices which cause refrigerant to be conveyed from the receiving chamber to the heating chamber to complete the cycle of operation.

3,824,804

REFRIGERATING MACHINES

Carl Ake Sandmark, Osbyholm 28, 24200 Horby, Sweden

Filed Aug. 22, 1973, Ser. No. 390,511
Int. Cl. F25b 25/02
U.S. Cl. 62—238 1 Claim



A refrigerating machine which is a combination of a compression type refrigerating apparatus and an absorption type refrigerating apparatus. The compression type refrigerating apparatus comprises a compressor, a condenser, a throttle valve and an evaporator connected in series so as to form a first closed loop. The absorption type refrigerating apparatus comprises a generator, a condenser, an evaporator and an absorber connected in series so as to form a second closed loop. The generator of the absorption apparatus is arranged as a heat exchanger for continuous transfer of heat from the cooling agent of the first loop, on the pressure side of the compressor, to the mixture of cooling agent and absorbent in the generator of the second loop. The evaporator of the absorption apparatus is connected as a heat exchanger for continuous cooling of the cooling agent of the first loop after the condenser of the compression apparatus on the input side of the throttle valve. By combining the generator and the compressor into a unit a decrease in temperature can be obtained in the outlet valve of the compressor.

3,824,805

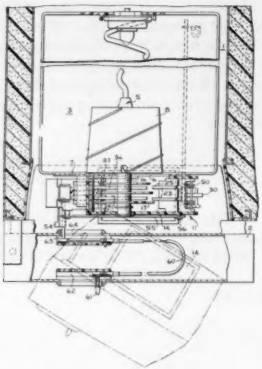
COMBINATION ICE CUBE AND CRUSHED ICE DISPENSER SELECTOR MEANS

Luis E. Prada, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Apr. 9, 1973, Ser. No. 348,940
Int. Cl. F25c 5/02
U.S. Cl. 62—320 3 Claims

An ice dispenser particularly for a household refrigerator includes an ice cube storage receptacle, integral dispensing

and crushing means for dispensing batches of either ice cubes or crushed ice of two different grades, and control means for

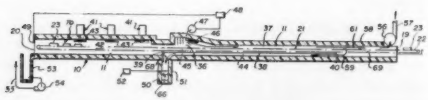


selectively operating the crushing means for delivery of the cube or crushed ice.

3,824,806
APPARATUS FOR REFRIGERATING ARTICLES

Richard C. Wagner, Clarendon Hills, Ill., assignor to Integral Process Systems, Inc., Park Forest, Ill.

Filed June 19, 1972, Ser. No. 264,133
Int. Cl. F25d *17/02*
U.S. Cl. 62—374 **10 Claims**



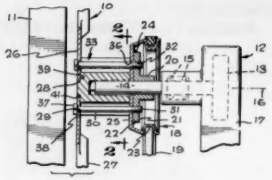
An apparatus for refrigerating, either freezing or chilling, articles and particularly food items including an insulated chamber having an entrance and an exit through which the articles are passed, apparatus for introducing a fluid cryogen in the form of vaporizable solid particles and gaseous fluid, the cryogen being for example carbon dioxide, and apparatus in the chamber for vaporizing any of the cryogen solid particles that might remain on the articles prior to the articles leaving the chamber. The disclosure also includes gas collecting and gas disposing device for disposing of cryogen gas externally of the apparatus in order to prevent excessive build-up of the gas in the ambient atmosphere surrounding the apparatus, the maximum amount of gas being thereby limited to about 5,000 parts of gas per million parts of ambient atmosphere, by weight.

3,824,807
ENGINE COOLING FAN SPACER STRUCTURE

Jay R. Hecht, 17847 Cathedral Pl., Encino, Calif. 91365

Filed Nov. 9, 1972, Ser. No. 304,917
Int. Cl. F16d *3/00*
U.S. Cl. 64—6 **14 Claims**

A spacer for mounting an engine cooling fan to a drive structure in spaced relation thereto, with the spacer having a forward centering portion engageable with the fan in centering relation, and having a rear pilot recess for receiving a pilot shaft of the drive structure, and with the pilot recess having a peripheral wall defining a series of circularly spaced elongated ribs of uniform internal diameter for engaging the pilot shaft.

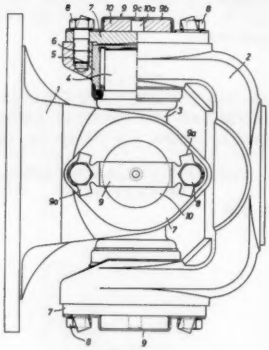


Circularly between these ribs, the wall of the pilot recess has surface areas which progressively taper as they advance more deeply into the recess.

3,824,808
COUNTERBALANCING DEVICE FOR COUPLING SHAFTS FOR UNIVERSAL JOINTS

Jacques Mangiavacchi, Chatou, France, assignor to Societe Anonyme: Glaenzer Spicer, Poissy, France

Filed Feb. 28, 1973, Ser. No. 336,878
Claims priority, application France, May 5, 1972, 72.16144
Int. Cl. F16d *3/26*
U.S. Cl. 64—17 A **5 Claims**



A counterbalancing device for correcting disequilibrium in shafts connected by universal joints having a yoke fixed to the driving shaft and a yoke fixed to the driven shaft, the yokes are connected by cross piece with journals at the ends of its arms rotatably mounted in bearings in the yokes. A stirruplike strap is secured by means of bolts which secure the associated plate. The strap receives interchangeable calibrated counterweights which are removably held therein by a resilient locking arrangement including an inwardly projecting portion received in a corresponding hole in the counterweight. The strap also acts as a lockwasher member for the bolts. By replacing the counterweights the shafts of the power transmission coupling may be balanced.

3,824,809
PATTERNING MECHANISM FOR MULTI-FEED CIRCULAR KNITTING MACHINES

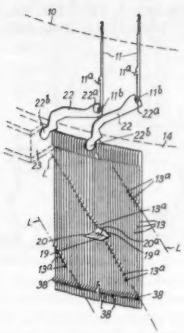
Norman Victor Canderton, Oadby, and Walter Goadby, Evington, both of England, assignors to Camber International (England) Limited, Leicester, England

Filed Mar. 5, 1973, Ser. No. 338,063

Claims priority, application Great Britain, Mar. 11, 1972, 11496/72

Int. Cl. D04b *15/68*

U.S. Cl. 66—50 R **15 Claims**



Pattern jacks in a multi-feed circular knitting machine are accommodated in a cylinder co-axial with but of a larger diameter than the needle cylinder. Jack butts are set out in diagonal lines. At each feed there is a slotted block housing a vertical bank of superimposed pairs of jack selector tuck and knit slides having cam faces upwardly sloping to two different extents heightwise. Springs urge selector slides into operative positions, slides being selectively held withdrawn clear of jack butts against the biassing influence. Movements of jacks imparted by slides are less than sufficient to raise corresponding needles to heights required. Thus movement transmitting and amplifying levers are provided between the jacks and the needles.

In each slotted block is a removable toothed programme comb having some teeth reduced in length and others broken away, according to pattern. Teeth act on projections on slides to hold them back. Jacks are either not raised or are raised to one of two heights to cause needles to miss, tuck or knit depending on the layout of teeth, half teeth and gaps on and in the programme comb.

3,824,810
KNITTING METHOD

Max William Betts, Coventry, and Frank Robinson, Borrowash, both of England, assignors to Courtaulds Limited, London, England

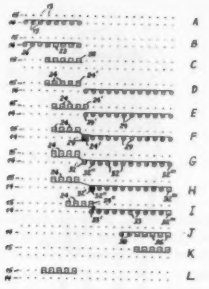
Filed Jan. 31, 1973, Ser. No. 328,319

Claims priority, application Great Britain, Feb. 2, 1972, 4807/72

Int. Cl. D04b *7/10*

U.S. Cl. 66—76 **4 Claims**

A method of making a blank for a knitted garment having a shoulder region, or part of such a garment, includes the steps of knitting a portion of the garment in the direction towards the shoulder region, on needles of a knitting machine having two opposed needle beds movable relative to one another, shaping this portion at its shoulder end by progressively taking needles out of action whilst holding loops on those needles, arranging these held loops on needles of one of the opposed needle beds, knitting another portion of the garment in the direction towards the shoulder region and arranging a course of loops of this other portion on needles of the other of the opposed needle beds, and joining the two portions by arranging one of the said held loops and a loop of the said course of loops on the same needle, knitting another course of the other portion in which a single loop is drawn through the said held loop and the said loop of the said course on the same needle, casting off this single loop, effecting relative movement of the needle beds to bring another of the said held loops and a loop



of the newly formed course of the other portion to positions for arrangement on the same needle, knitting another course of the other portion in which a single loop is drawn through the said loops on the same needle, effecting relative movement of the needle beds once more and so on until the other portion is completed.

Further portions of the garment may be joined to the blank in the same way until the blank comprises all the portions required for the body and sleeves of a garment.

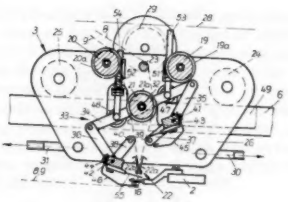
3,824,811
WARP KNITTING MACHINE

Fery Heilmann, Limbach-Oberfrohna, and Peter Edel, Karl-Marx-Stadt, both of Germany, assignors to Institut fur Textilmaschinen, Karl-Marx-Stadt, Germany

Filed June 29, 1973, Ser. No. 375,309

Int. Cl. D04b *23/06*

U.S. Cl. 66—84 **10 Claims**



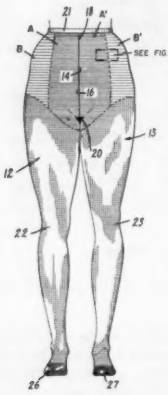
A warp knitting machine, particularly a stitching machine, having a reciprocating weft laying device is provided with devices for handling webs as the weft materials. More particularly, to assure that the webs do not twist when they are pushed onto needles of transport chains at the motion reversal points of the weft laying device, for operation in conjunction with the devices for pushing the webs onto the needles are provided devices for retaining the webs in untwisted configurations as they are pushed onto the needles.

3,824,812

PANTY GARMENT WITH HIGH RISES AT THE LATERAL PORTIONS OF THE PANTY

Robert M. Matthews, Pittsboro, and Albert W. Petty, Siler City, both of N.C., assignors to Kellwood Company, St. Louis, Mo.

Filed Mar. 1, 1972, Ser. No. 230,562
Int. Cl. A41b *9/04*
U.S. Cl. 66—177 **5 Claims**



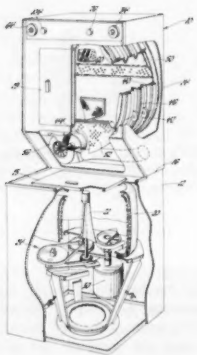
A panty, panty hose, panty shirt, or the like where the panty is knitted with less courses at its lateral portions than at its front and rear portions will cause the lateral portions to be drawn together wale-wise so that the lower ends of the lateral portions will be above the crotch of the garment.

3,824,813

POWER SUPPLY CONTROL CIRCUIT FOR 120 VOLT COMBINATION WASHER AND DRYER

Ted C. Davis, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 26, 1973, Ser. No. 335,581
Int. Cl. D06f *25/00, 29/00, 33/02*
U.S. Cl. 68—12 R **1 Claim**



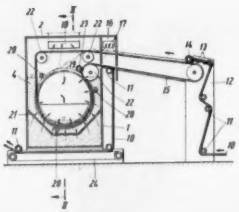
This invention relates to a control circuit for a combination clothes washer and dryer adapted to operate on a 120 volt, 15 ampere, electrical supply. The control circuit includes a heat lockout relay energizeable to disconnect the dryer heater and dryer timer motor when the washer motor is in operation, thereby to limit the electrical current required by washer and/or dryer to the 15 ampere supply available. The circuit permits clothes tumbling to continue with unheated room air during washer motor operation.

3,824,814

DEVICE FOR THE TREATMENT OF LENGTHS OF TEXTILE MATERIAL

Heinz Fleissner, Frankfurt am Main, Germany, assignor to VEPA AG, Basel, Schweiz, Switzerland

Continuation of Ser. No. 883,469, Dec. 9, 1969, abandoned.
This application June 5, 1972, Ser. No. 259,629
Int. Cl. B05c *3/132*; **D06c** *3/00*
U.S. Cl. 68—18 R **15 Claims**



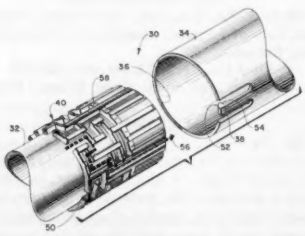
The present disclosure is directed to an apparatus for the treatment of lengths of textile material which comprises a treatment chamber adapted to contain a treatment liquor, at least one sieve drum means provided with a drive means rotatably disposed in said treatment chamber and at least partially disposed in the treatment liquor, the liquor level on the outside of the sieve drum means being higher than the liquor level inside the sieve drum means, thereby providing a fluid flow from the outside to the inside thereof, an outflow chamber disposed at one face of the sieve drum means for returning the treatment liquor from the inside to the outside thereof, tensioning means extending into the treatment chamber, around the sieve drum means, and removed from said treatment chamber, inlet means for introducing the material to be treated to said tensioning means and outlet means for removing the textile material from the treatment chamber.

3,824,815

LABYRINTH LOCKING APPARATUS

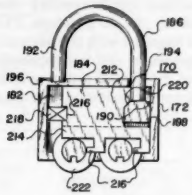
William A. Darling, 18554 Lanark St., Reseda, Calif. 91335

Filed Oct. 16, 1972, Ser. No. 297,609
Int. Cl. E05b *37/20*
U.S. Cl. 70—18 **21 Claims**



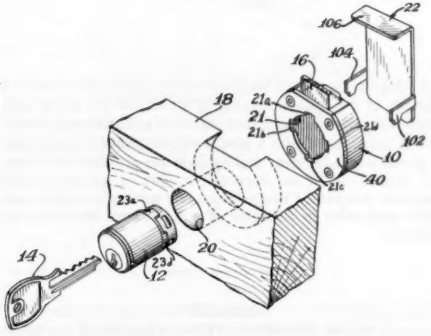
A locking apparatus to prevent unauthorized unlocking movement between a first member and a second member, a labyrinth employed between the members, the labyrinth requiring a known combination by an authorized person to produce the desired unlocking movement.

3,824,816
COMBINATION PADLOCK
Lew Dobrjanskyj, Flushing, and Ruediger Einhorn, Katonah, both of N.Y., assignors to Coats & Clark, Inc., New York, N.Y.
Filed May 25, 1972, Ser. No. 256,648
Int. Cl. E05b *37/14*
U.S. Cl. 70—25 14 Claims



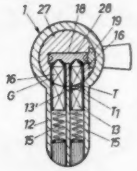
Combination padlock having a slidable internal bolt mounted between mating shells forming the body of the padlock. Combination number wheels are provided with internal slots that are engagable by projections formed on the bolt when slid to the unlocked position allowing the hasp to be released. Another embodiment utilizes combination cylinders having slots that receive corresponding projections on the bolt for the unlocked position. When the combination wheels or cylinders are rotated so that the projections cannot slide into the slots, the padlock remains in locked position.

3,824,817
REMOVABLE CYLINDER LOCK
John L. Orr, Rockford, Ill., assignor to Keystone Consolidated Industries, Inc., Peoria, Ill.
Filed Mar. 8, 1973, Ser. No. 339,187
Int. Cl. E05b *65/44, 9/06*
U.S. Cl. 70—81 9 Claims



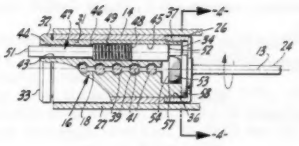
A lock device includes a housing and a removable cylinder. The cylinder is retained in the housing by a retainer spring attached to the housing and engageable with channels defined in the cylinder. A tool may be inserted through slots in the housing to engage and displace the retainer spring for removal of the cylinder. The cylinder may thus be removed from the housing and altered, repaired or replaced.

3,824,818
CYLINDER-LOCK
Charles O. Neale, Basel, Switzerland, assignor to Firma Josef Voss KG, Bruhl Bez. Koln, Germany
Filed Dec. 1, 1969, Ser. No. 881,144
Claims priority, application Germany, Nov. 30, 1969, 1812052; Nov. 30, 1969, 1812053; Nov. 30, 1969, 1812051
Int. Cl. E05b *27/06, 17/04*
U.S. Cl. 70—358 17 Claims



A cylinder lock which comprises a core having a key slot. A key is to be inserted in the key slot and includes wide faces for receiving recesses therein. Tumblers are provided in the core adjusted by the key with the recesses. A housing receives the core and includes a flange extending radially to the core and has bores. The key slot is disposed in symmetric cross position to the flange. At least two rows of the tumblers are arranged in the flange. The tumblers have a non-round cross-section and sit non-rotatably in the bores of the flange.

3,824,819
LOCK INDICATOR
Ralph E. Neary, San Francisco, Calif., assignor to Schlage Lock Company, San Francisco, Calif.
Filed Apr. 16, 1973, Ser. No. 351,512
Int. Cl. E05b *41/00*
U.S. Cl. 70—432 9 Claims

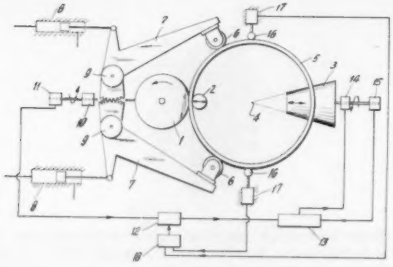


A lock indicator has a lock body with a lock plug rotatable in the body about an axis. The lock plug has an inner end face and an outer end face as well as a bore extending through the plug between the end faces. A rod is slidable in the bore and has a follower end in abutment with a cam on the end of a driver bar rotatable about the axis and adapted to slide the rod against spring pressure to project the rod from the outer face of the body when the driver bar is rotated relative to the plug. The driver bar is usually rotated by a hand control on the interior side of the lock.

3,824,820
RING ROLLING MILL
Josef Jeuken, Holzwickede; Gustav Vieregge, Dortmund-Wambel, and Konrad Meyer, Dortmund-Wickede, all of Germany, assignors to Rheinstahl AG, Essen, Germany
Filed May 7, 1973, Ser. No. 357,779
Claims priority, application Germany, May 9, 1972, 2222606
Int. Cl. B21h *1/06*
U.S. Cl. 72—10 17 Claims

A ring rolling mill has a pair of radial rolls acting on a workpiece ring by engaging radially opposite peripheries thereof,

and a pair of axial rolls, which are preferably truncated conical rolls, acting axially on the ring by engaging axially opposite end surfaces thereof. The two rolls of each pair are adjustable toward each other and at least one roll of each pair is driven by associated adjustable speed driving means. One driving means is adjustable to a preselected nominal peripheral speed of the roll driven thereby, and a control adjusts the other driving means to set the peripheral speed of the roll driven thereby in accordance with the peripheral speed of the roll driven by the one driving means. Sensors engageable with the ring detect power transmission, through the ring, between the two driving means, and a second control is operable, responsive to detection of such power transmission by the sensors, to restore the peripheral speeds of the driven rolls into accordance with each other.



3,824,821

OVERLOAD SAFETY DEVICE FOR THE DRIVE ELEMENTS OF PRESSES

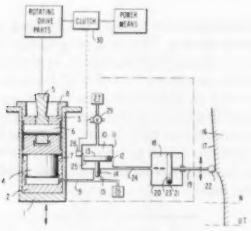
Ewald Bergmann; Franz Schneider, both of Goeppingen; Rudi Brandstetter, Faurndau, and Rolf Kellenbenz, Goeppingen, all of Germany, assignors to L. Shuler GmbH, Goppingen, Germany

Filed June 12, 1972, Ser. No. 261,669

Claims priority, application Germany, June 11, 1971, 2128867

Int. Cl. B21b *37/08*

U.S. Cl. 72—20 **9 Claims**



An overload safety device for the drive elements of presses which includes an arrangement for varying the permissible pressure force on the ram of the press in dependence of the position of the ram within its operating stroke. A characteristic curve representing the permissible maximum safe pressure force for each position of the ram throughout its entire operating stroke is depicted with a mechanical or electrical control arrangement operably connected to an overload system to vary the actuation ram pressure of the overload system in dependence on the ram position. In one embodiment a cam surface on a fixed part of the press is arranged generally parallel to the direction of travel of the ram. A control linkage, including a cam part riding on the cam surface, is arranged for movement with the ram. The control linkage includes a piston and cylinder arrangement having a compressed air supply pressure which is varied by movement of the cam part over the cam surface. A second piston and cylinder arrangement is provided which directly communicates with an oil tank arranged in the force train of the ram. This second arrangement includes a switch for relieving the oil pressure in the tank upon a certain predetermined movement of the second piston caused by the oil pressure. The variable compressed air supply is engaged with this second piston to effectively vary the oil pressure, and consequently the ram pressure, which will move the second piston to relieve the oil pressure. Other embodiments, including electrical embodiments may also be utilized.

3,824,822

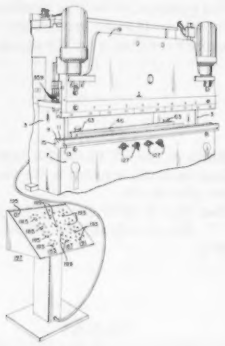
PROGRAMING SYSTEM FOR PRESS BRAKES OR THE LIKE

Rolland A. Richardson, Alameda, Calif., assignor to Canron, Inc., Oakland, Calif.

Filed Aug. 25, 1972, Ser. No. 283,857

Int. Cl. B21c *51/00*

U.S. Cl. 72—36 **13 Claims**



A programing system for press brakes or the like wherein a plurality of backgauge positioning means are pre-set in nonfunctioning condition and then activated to functioning condition in accordance with a predetermined sequence program. A plurality of adjustable depthgauges are provided and these are also selected in accordance with a predetermined sequence program. Changes from one setting to another are made responsive to actuation of a depth limit switch on the machine.

3,824,823

FUEL FILTER TESTING APPARATUS

Anthony P. Pontello, Springfield, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

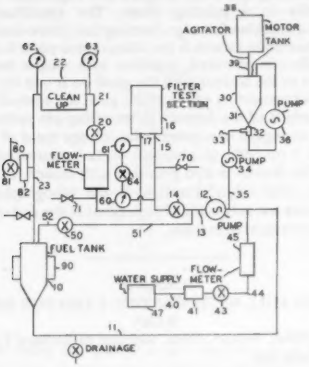
Filed Feb. 1, 1973, Ser. No. 328,564

Int. Cl. G01m *15/00*

U.S. Cl. 73—432 R **5 Claims**

The invention disclosed herein provides an improved apparatus and system for testing the efficiency of fluid filters by

providing an automatic, continuously operating, test apparatus to accurately measure the water and solid contaminants flowing into the fluid or fuel filter and to measure water and contaminants passed therethru.



3,824,824

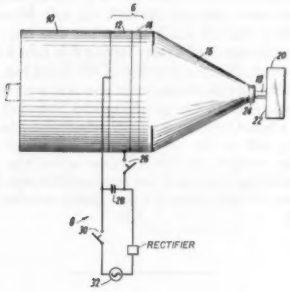
METHOD AND APPARATUS FOR DEFORMING METAL

Basil P. Leftheris, Northport, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation-in-part of Ser. No. 863,045, Oct. 2, 1969. This application Apr. 17, 1972, Ser. No. 244,402

Int. Cl. B21d *26/14*

U.S. Cl. 72—56 **11 Claims**



Method and apparatus for forming or deforming a metal workpiece by passing a stress wave through the metal workpiece sufficient to render it momentarily plastic. The apparatus is basically comprised of a stress wave focusing device or amplifier. In operation, a workpiece is placed in a die or shaping means. The stress wave amplifier is then arranged to direct or focus the stress wave to the metal workpiece. Next, a stress wave is generated and passed through the stress wave focusing device, imparting a momentary state of plasticity to the metal workpiece.

3,824,825

FORMING OF MATERIALS

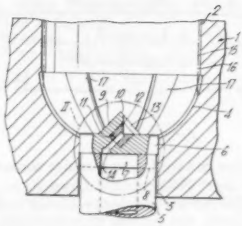
Derek Green, Lytham St. Annes, England, assignor to United Kingdom Atomic Energy Authority, London, England

Continuation-in-part of Ser. No. 880,127, Nov. 26, 1969, abandoned. This application May 7, 1973, Ser. No. 357,559

Claims priority, application Great Britain, Mar. 16, 1973, 12847/73

Int. Cl. B21c *23/08*

U.S. Cl. 72—60 **14 Claims**



A process for producing an extrusion of small cross section from a workpiece in which the workpiece is subjected to a bulk compressive stress in a container so that the end of the workpiece is forced into a reducing die at the end of the container. The material of the workpiece in the reducing die is subjected to an additional localised compressive stress by a tool member having a working face which is applied to the material of the workpiece in the reducing die. Under the combined compressive stresses the material of the workpiece is formed through a die orifice. In one arrangement a rotary tool member is employed which is moved in a circular path through the workpiece material in the reducing die. In another arrangement the tool member is fixed against rotation and the workpiece is rotated.

3,824,826

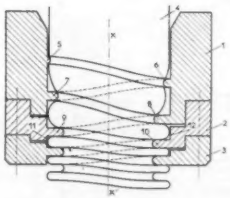
METHOD AND APPARATUS FOR FORMING FLEXIBLE CORRUGATED MEMBERS

Joseph Charvet, Dessancourt, France

Division of Ser. No. 129,357, March 30, 1971, which is a continuation-in-part of Ser. No. 738,215, June 19, 1968, abandoned. This application Apr. 30, 1973, Ser. No. 355,521

Int. Cl. B21d *15/04*

U.S. Cl. 72—77 **11 Claims**

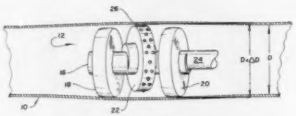


A method and apparatus for converting smooth walled tubular members into corrugated flexible members. The invention contemplates stamping grooves of progressively increasing depth into the outer walls of the smooth tube and thereafter compressing the thus corrugated member while preventing deformation and expansion in the radial direction to thereby define a flexible tube characterized by a helically corrugated wall.

3,824,827
APPARATUS FOR FORMING AN INTERFERENCE PATTERN OF MULTIPLE INDENTATIONS IN THE INTERIOR WALL OF CONVEYING TUBES

Bruce W. Stockbridge, Kingsport, and Albert E. Spaller, Jr., Johnson City, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 5, 1973, Ser. No. 367,300
Int. Cl. B21d *51/16*
U.S. Cl. 72—123 **6 Claims**

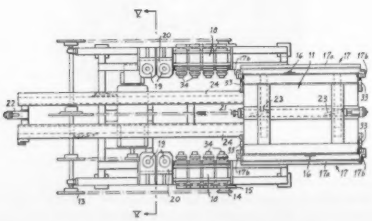


Apparatus, upon connection to a motive source, being self-advancing in an auger-like manner for forming an interference pattern of multiple indentations in the interior wall of cylindrical conveying tubes, the pattern of indentations serving to eliminate streamer problems in tubes used to pneumatically convey plastic particulate material. The apparatus has an effective diameter greater than the inside diameter of the tube so as to spring and distort temporarily the tube from a cylindrical cross-section toward an elliptical cross-section, thereby using the inherent spring effect of the tube to provide force sufficient to form the indentations. The apparatus includes a pair of guide rolls and an indenting roll mounted on a support, the indenting roll having multiple teeth projecting from its periphery. The guide rolls are eccentrically displaced to one side of and at an oblique angle to the axis of the support, and the indenting roll is eccentrically displaced to the opposite side of the axis of the support and at an oblique angle opposite to that of the guide rolls. The effective diameter of the indenting roll including the projecting teeth is at least one half the inside diameter of a tube to be indented and is preferably of such diameter as to encompass the axis of the support.

3,824,828
PREPARATION OF LITHOGRAPHIC PLATES

Leonard Kay Billows, Hemel Hempstead, and Raymond John Gosling, Cranleigh, both of England, assignors to Protocol Engineering Limited, St. Albans, Hertfordshire, England

Division of Ser. No. 86,259, Nov. 2, 1970, abandoned. This application Nov. 14, 1972, Ser. No. 306,416
Claims priority, application Great Britain, Nov. 3, 1969, 53863/69
Int. Cl. B21d *5/08*
U.S. Cl. 72—181 **2 Claims**

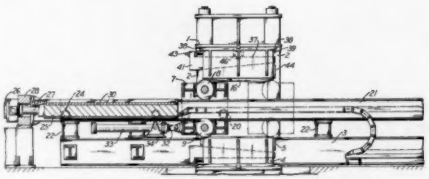


This invention relates to the preparation of lithographic plates for printing purposes, one of its objects being to provide a flow system to speed up the plate preparation, ready for the press. From one aspect, the invention provides a system for preparing the plates which comprises a light box for printing down plates fed thereto from prepared masters, such as camera films, after which the exposed lithographic plate is conveyed by a transfer system to a processing station for development, fixing and washing, and then the plate is fed to an edge-forming station to prepare and edge-form the plates for transfer to a printing drum. The specification also describes a machine for edge-forming the plates comprising a fixed former plate to which the lithographic plate is fed and a set of rollers is provided, together with means for relative movement of the former with the plate on it and the said rollers, so that projecting edges of the plate are formed over the adjacent edges of the former. A travelling pin system is also provided to engage in register holes in edge areas of the plate to enable a plurality of plates to be fed sequentially to the former. The former is also provided with means for reducing its width, after edge-formation of the lithographic plates, which means are automatically operated at the end of the said relative movement operation.

3,824,829
ROLLING MILL WITH SHIFTING CAMS FOR SHAPING BARS

John S. Miller, Poland, Ohio, assignor to Richard P. Krause, New Castle, Pa.

Filed June 4, 1973, Ser. No. 366,423
Int. Cl. B21b *1/42*
U.S. Cl. 72—214 **9 Claims**



A roll carriage provided with a vertically movable roll is normally located at one end of a rolling mill housing but is movable back and forth through a passage in the housing. An anvil for supporting a heated bar is movable back and forth through the same passage beneath the roll. Mounted in the housing above the roll is a first cam bar that has a lower surface of a predetermined shape. Beside this cam a similar cam bar is mounted. When a portion of the anvil has moved forward beneath the roll, the carriage also is moved forward until the roll engages both the overlying first cam and the central portion of a heated bar on the anvil, whereupon the roll shapes the trailing end of the bar. Then the cam bars are moved sideways to position the second cam above the roll so that when the carriage and anvil are returned through the housing passage the roll will shape the previously unrolled end of the heated bar.

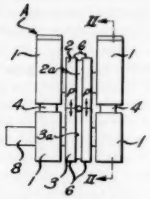
3,824,830
TWO-HIGH ROLLING STAND

Tom Joachim Bennet; Knut Lennart Nordstroem, and Karl Olof Polhaell, all of Smedjebacken, Sweden, assignors to Morgardshammer Aktiebolag, Smedjebacken, Sweden

Filed Nov. 17, 1972, Ser. No. 307,353
Claims priority, application Sweden, Nov. 17, 1971, 14690/71
Int. Cl. B21b *35/00*
U.S. Cl. 72—249 **9 Claims**

A rolling stand for hot or cold rolling of bar steel or wire rod stock comprises first and second rolls which define a nip

therebetween. The first and second rolls have surface portions which engage the stock and reduce its cross section as the stock advances therebetween. The first and second rolls also have drive-transmitting surface portions which engage each



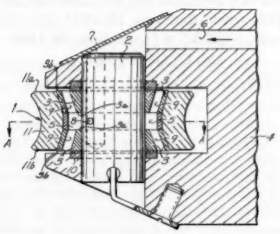
other and which are spaced axially from the stock-engaging surface portions. A means is provided for establishing a drive-transmitting relationship between the drive-transmitting surface portions of the rolls so that the second roll is driven from the first roll by the drive-transmitting surface portions.

3,824,831

GUIDE ROLLER IN ROLLER GUIDES

Nils Erik Bock, Smedjebacken, Sweden, assignor to Morgardshammer Aktiebolag, Smedjebacken, Sweden

Filed June 6, 1973, Ser. No. 367,525
Claims priority, application Sweden, June 7, 1973, 737463
Int. Cl. B21b *39/14*
U.S. Cl. 72—251 **4 Claims**



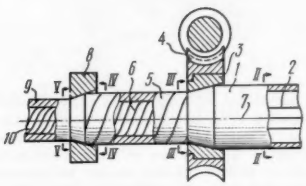
An improved guide roller assembly is utilized in a roller guide to guide or direct high-speed rolled stock. The guide roller assembly includes a fixed axle on which a rotatable guide wheel or roller is mounted. A drive ring or turbine wheel is provided within the guide roller. When the guide roller is to be accelerated to the speed of the rolled stock, fluid under pressure is conducted through one or more passages formed in the axle and directed against reaction surfaces formed on the drive ring. Exhaust passages conduct the fluid away from the reaction surfaces. These exhaust passages have central axes which extend transversely to the path along which the drive fluid moves into engagement with the reaction surfaces.

3,824,832

METHOD OF PRODUCING PIPES WITH INTERNAL HELICAL FINS

Jury Stepanovich Starostin, ulitsa Krashykn Kommunarov, 6, kv. 36; Viktor Ivanovich Plokhov, ulitsa Stroitelei, 20, kv. 75; Veniamin Kuzmich Erokhov, ulitsa Svobody, 230, kv. 62; Vladimir Prokopievich Ivanov, prospekt Metallurgov, 60, kv. 55, all of Kuibyshev; Vladimir Nikolaevich Krotkov, ulitsa Chkalova, 24/32, kv. 132, Moscow; Albert Viktorovich Anisimov, Novo-Mytischinsky prospekt, 23/7, kv. 102, Mytischi Moskovskoi oblasti; Rustem Nurievich Ajupov, ulitsa Gvardeiskaya, 26, kv. 10, and Mikhail Fedotovich Golovinov, ulitsa Pugachevskaya, 59, kv. 16, both of Kuibyshev, all of U.S.S.R.

Filed Jan. 15, 1973, Ser. No. 323,404
Int. Cl. B21c *3/12*
U.S. Cl. 72—285 **1 Claim**



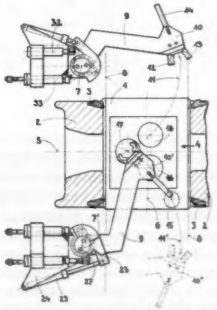
A pipe blank with internal longitudinal fins is subjected to drawing and concurrent rotation so as to alter the shape of its cross-section in the course of rotation to prevent the pipe blank from slipping in relation to the drawhole. The operations result in producing the pipe with internal fins in the form of a helix. Next, the pipe produced thereof is drawn additionally to give it the requisite shape. The herein-described method is suitable for the production of pipes with internal helical fins having practically any height required.

3,824,833

FORGING PRESS

Horst Bachmann, Rodental, Germany, assignor to Langenstein & Schemann Aktiengesellschaft, Coburg, Germany

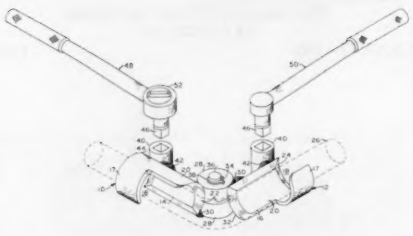
Filed Feb. 7, 1973, Ser. No. 330,194
Claims priority, application Germany, Feb. 7, 1972, 2205607; Feb. 7, 1972, 2205608
Int. Cl. B21d *45/00*
U.S. Cl. 72—361 **4 Claims**



A forging press in which there is provided a press frame, a table plate, a ram above the table plate, a working space defined between the table plate and the ram, at least one die situated on the table plate, and pincers and grippers for hold-

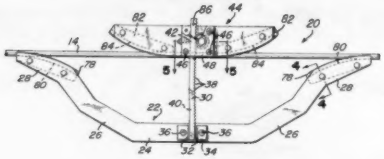
ing a workpiece, with the pincers or grippers being carried by an extremity of a handling arm or lever and being movable over and away from the or each die.

3,824,834
CABLE BENDER
Henry B. Durham, 405 Chestnut St., Birmingham, Ala. 35206
Filed Mar. 5, 1973, Ser. No. 337,833
Int. Cl. B21d *7/024*
U.S. Cl. 72—387 **9 Claims**



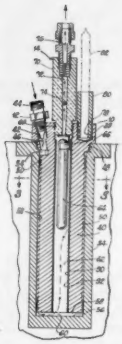
A cable bender comprising a pair of cable holding cradles pivotally connected together at adjacently positioned inner ends and wherein no restraint is applied to the cable in the region of the cable where it is bent. Wrench members are adapted to be connected to the cradles at opposite ends of the bender and bending is achieved by applying a torque and counter torque, respectively, to the cradles by the wrench members.

3,824,835
CABLE BENDER
Richard L. Jackson, Lewisburg, Ohio, assignor to Jackson Communication Corporation, Brookville, Ohio
Filed Dec. 4, 1972, Ser. No. 311,470
Int. Cl. B21d *7/06*
U.S. Cl. 72—389 **11 Claims**



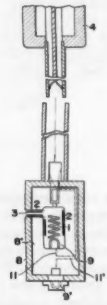
A lightweight, manually operable cable bender particularly adapted for forming expansion loops in relatively stiff cable, such as coaxial cable, during aerial cable stringing operations. The bender includes a lightweight plate member forming the main frame which carries a pair of bending shoes on its outer ends and an auxiliary frame carrying intermediate bending shoes, with the main and auxiliary frames interconnected by a rack and pinion to draw the shoes carried by the frames towards each other and form a loop in a straight piece of cable engaged by the shoes. The cable bender can be constructed to handle a single cable at a time or two or more cables simultaneously. In either case the bender permits the formation of loops at any point along the cable, eliminating the necessity of having access to a cable end in order to form a loop therein.

3,824,836
GAS PERMEATOR
Norman A. Lyshkow, Chicago, Ill., assignor to Combustion Equipment Associates, Inc., New York, N.Y.
Filed Nov. 21, 1972, Ser. No. 308,540
Int. Cl. G01n *31/00*
U.S. Cl. 73—1 R **19 Claims**



A method and apparatus for supplying a source of a pollutant gas admixed with an inert gas, wherein the inert gas is passed through a passage defined by a permeator body of a distance sufficient to permit the inert gas to reach thermal equilibrium with the permeator body, and the inert gas is subsequently passed through a centrally disposed opening in the permeator body for admixture with a pollutant gas which has diffused through a gas-permeable container positioned in the opening.

3,824,837
METHOD OF RAPIDLY DETERMINING THE SOLIDUS LINE OF MOLTEN STEEL
Noriyoshi Nagaoka, and Genichi Usui, both of Kawasaki, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan
Continuation-in-part of Ser. No. 880,338, Nov. 26, 1969, abandoned. This application Sept. 15, 1971, Ser. No. 180,883
Claims priority, application Japan, Nov. 30, 1968, 43-87309
Int. Cl. G01n *25/04*
U.S. Cl. 73—17 R **6 Claims**



A method for the rapid determination of the solidus line of molten steel, from which the carbon content of the steel can be determined. First there is placed in a chamber of a measur-

ing unit a predetermined quantity of metallic bodies which have the property of melting in molten steel so as to cool the latter without causing any heat-producing reaction so that the bodies act only to cool the molten steel by being absorbed into the latter causing the temperature of the molten steel to fall. The quantity of bodies placed in the chamber is determined in accordance with the temperature of a bath from which molten steel is subsequently taken and in accordance with the amount of these metal bodies required to bring about complete melting of the melting bodies in the molten steel when the latter has nearly reached the solidification temperature, and the amount of cooling agent formed by these bodies being sufficient to bring about a rapid cooling of the molten steel. With these bodies thus situated in the chamber molten steel is then delivered thereto so as to be rapidly cooled by the cooling agent formed by the bodies down to a temperature which is nearly the solidification temperature of the molten steel, and then the latter is permitted to cool naturally to the solidification temperature. During the cooling of the molten steel in the chamber of the measuring unit, the temperature of the molten steel is constantly measured and recorded to provide a curve where the point of solidification is sharply and clearly apparent.

3,824,838

PROCESS GAS CHROMATOGRAPHIC APPARATUS

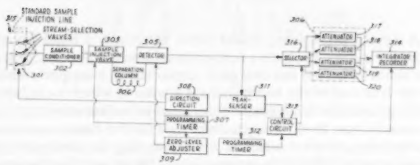
Takawo Ohtsu, Yokohama; Yukinobu Nakamura, Tokyo, and Fujihiko Sekido, Yokohama, all of Japan, assignors to Japan Gasoline Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 75,279, Sept. 24, 1970, abandoned, which is a continuation of Ser. No. 733,046, May 29, 1968, abandoned. This application Apr. 7, 1972, Ser. No. 242,126

Claims priority, application Japan, May 31, 1967, 42-34124

Int. Cl. G01n *31/08*

U.S. Cl. 73—23.1 **11 Claims**



A control system in a process gas chromatographic apparatus for analyzing a stream sample from a chemical process plant, comprises a peak senser means for sensing a detector signal, a programming timer means providing a signal corresponding to the retention time of only the component to be determined in the sample to the control system, and a control circuit actuating an integrater-recorder and sensitivity-variable means, whereby the concentration of said component in the sample is automatically and continuously obtained in digital value as a proportion to the total amount of the whole of the components contained in the sample.

3,824,839

LEAK DETECTING SYSTEM AND METHOD FOR PASSING A MEASURED SAMPLE OF GAS TO A LEAK DETECTOR

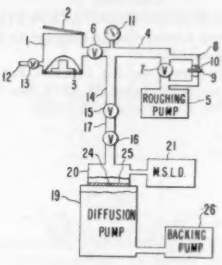
Walton Ellis Briggs, Lynnfield, Mass., assignor to Varian Associates, Palo Alto, Calif.

Continuation of Ser. No. 183,495, Sept. 24, 1971, abandoned. This application Aug. 3, 1973, Ser. No. 385,622

Int. Cl. G01m *3/04*

U.S. Cl. 73—40.7 **21 Claims**

A leak detecting system has two valves in line between the test piece and the leak detector to provide a fixed volume of gas between the valves. The valve nearest the sample is opened while the valve nearest the leak detector is closed. If the test piece has a leak, a measured quantity of the test gas leaking through the test piece will be collected in said fixed volume. Then the valve nearest the test piece is closed and the valve nearest the leak detector is opened to conduct the measured volume of gas to the detector. Additional valve means are employed to provide a plurality of different size fixed volumes. In which case, the valves are operated to conduct the fixed volumes of gas to the leak detector in sequence starting with the smallest volume and proceeding to the next larger volume until a leak is signaled by the leak detector.



3,824,840

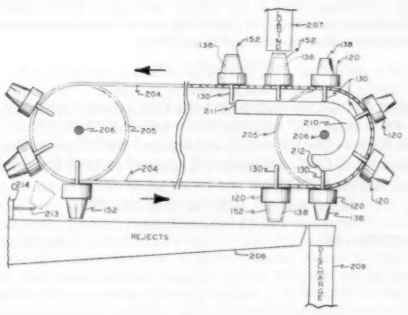
APPARATUS FOR TESTING AND SORTING CUPS

Ralph G. Amberg, Monticello, Ind., assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 140,545, May 5, 1971, abandoned. This application Mar. 16, 1973, Ser. No. 342,179

Int. Cl. G01m *3/04*

U.S. Cl. 73—45.3 **22 Claims**



A device for sorting relatively fragile cups manufactured from coated paper, thin plastic, foamed plastic material and the like. A nonporous, resilient, thin membrane is provided which has an annular contact area for receiving the rim area of the cup and establishing continuous contact with a cup surface extending around the cup adjacent the rim area in a closed loop. The membrane is fixedly supported only outside of and around at least one edge of the annular contact area, leaving the membrane movable throughout the contact area. Air impervious means spans the area defined by an inner edge of the annular contact area of the membrane. The air pressure on the cup-adjacent side of the air impervious element is reduced below the ambient air pressure to cause relative sealing movement of the annular contact area of the membrane and the closed loop surface of the cup received on the membrane. The

pressure on the cup-adjacent side of the air impervious element is monitored to detect the presence or absence of a sealing contact between the membrane and the closed loop surface of the cup to sort good cups from defective cups.

3,824,841

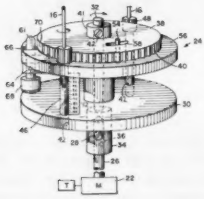
METHOD FOR SEDIMENTATION STUDY

Brian S. Bull, Loma Linda, Calif., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Continuation-in-part of Ser. No. 113,166, Feb. 8, 1971, abandoned. This application Oct. 22, 1971, Ser. No. 191,886

Int. Cl. G01n *15/04, 33/16*

U.S. Cl. 73—61.4 **25 Claims**



Method for the study of the sedimentation characteristics of whole blood comprising the steps of cyclically applying greater than gravity force laterally to a thin, substantially vertically oriented column of whole blood, and rotating the column about 180 degrees about its own axis between each cycle. The sample columns are placed in tubes arranged with their long axes oriented substantially parallel to the axis of rotation of a centrifuge and the tubes are rotated about their own long axes between each cycle and only when at or substantially at rest. A preferred test operation using four cycles of 45 second duration is described with the rotation of the columns being effected by reversal of the direction of rotation of the centrifuge head at the end of each cycle. Other cycle durations are described for providing results correlatable with standarized sedimentation test procedures.

3,824,842

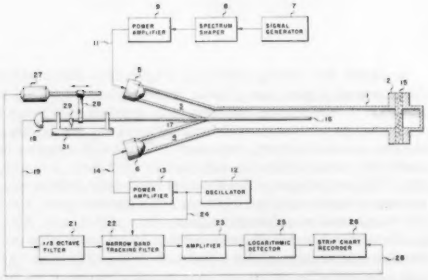
APPARATUS AND METHOD FOR THE MEASUREMENT OF ACOUSTIC ABSORPTION AND IMPEDANCE

Leslie Spencer Wirt, Newhall, and Duane Lloyd Morrow, Saugus, both of Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Apr. 20, 1972, Ser. No. 245,776

Int. Cl. G01n *29/00*

U.S. Cl. 73—69 **21 Claims**



Apparatus and method for measuring the acoustical impedance and/or the absorption coefficient of materials of the class which exhibit nonlinear behavior at high sound intensities. A high-intensity biasing noise having a broadband spectrum and a low intensity pure sinusoidal tracer tone are introduced in combination into a standard impedance tube or standing-wave apparatus. The standing-wave pattern in the tube is measured by a pressure microphone probe movable along the axis of the tube. The tracer tone is retrieved by highly selective filtering and used to provide a measurement signal which corresponds to the response of the material. By sampling the standing wave pattern in the tube, the entire spectrum of the broadband noise response may be obtained.

3,824,843

DEVICE FOR HOLDING TEST HEAD

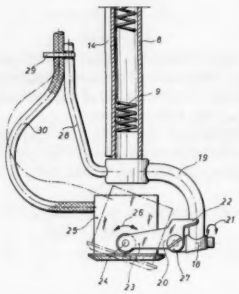
Johann Gebeshuber, and Wilhelm Meusel, both of Nurnberg, Germany, assignors to Maschinefabrik Augsburg-Nurnberg, Aktiengesellschaft Werk Nurnberg, Nurnberg, Germany

Filed Oct. 25, 1972, Ser. No. 300,721

Claims priority, application Germany, Oct. 27, 1971, 2153397

Int. Cl. G01n *29/04*

U.S. Cl. 73—71.5 US **6 Claims**



A device for holding a test head, especially a head for ultrasonic testing in which a resiliently extensible but nonrotatable beam structure has one part connected to a support, while at the free end of the beam there is a yoke to which a cardanic holding member is pivotally connected on a first axis which is perpendicular to the longitudinal axis of the beam and with the holding member adapted for supporting the test head on an axis perpendicular to the axis of the beam and also perpendicular to the axis on which the holding member is pivoted to the yoke.

3,824,844

SOIL MOISTURE MONITOR

Robert E. Strickland, Los Angeles, Calif., assignor to Water Rite Inc., Los Angeles, Calif.

Filed May 11, 1973, Ser. No. 359,617

Int. Cl. G01n *19/10, 33/24*

U.S. Cl. 73—73 **9 Claims**

An inexpensive device is provided for sensing the moisture content of soil, particularly around house plants. The device

has a dark colored background with a thin, permeable hydrophilic film in front of it. The film is protected by a transparent plastic layer in front and the assembly is heat sealed together. A hole is pierced through the protective layer for giving the permeable film access to soil moisture. The permeable film is preferably a sheet of light colored, single ply facial or toilet tissue which has high reflectivity and low transmission of light when dry but which becomes quite translucent when wet. The extent of dark colored background exposed by the wet film indicates soil moisture content.

3,824,845

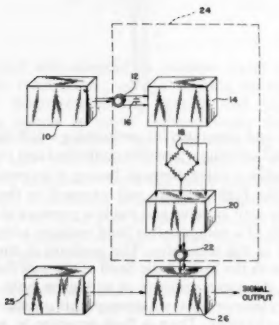
METHOD OF TRANSFERRING ELECTRICAL DATA SIGNALS FROM MOVING BODIES

H. Douglas Huebner, Newport News, Va., assignor to Newport News Shipbuilding & Dry Dock Company, Newport News, Va.

Filed Dec. 22, 1972, Ser. No. 317,865

Int. Cl. G01l 3/10; G01n 3/00

U.S. Cl. 73—88.5 R **6 Claims**



Method of transferring electrical data signals from moving bodies, particularly low frequency, low level signals such as generated by strain gages. The method is distinguished in its use of an input holding capacitor to transmit low impedance signals while eliminating high impedance signals, such that a continued output signal is provided, notwithstanding discontinuous contact between sliding contact devices attached to the moving body and brushes attached to the receiving signal circuit.

3,824,846

HOLDER FOR FORCE TRANSDUCER

John-Erik Andersson, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

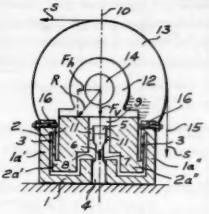
Filed Apr. 14, 1971, Ser. No. 133,888

Claims priority, application Sweden, Apr. 14, 1970, 5094/70

Int. Cl. G01n 3/20

U.S. Cl. 73—100 **8 Claims**

There is disclosed a holder device for mounting a force-responsive transducer of the type sensing transverse or bending stresses. The holder device comprises a stationary member and a movable member for applying a force in a selected measuring direction to the movable member. Connecting members join the movable member to the stationary member and are positioned to act as a mild restraining force in the selected measuring direction. The stationary member and the movable member each include a recess for receiving therein an actuating part and a mounting part respectively of the transducer to be mounted on the holder device. The recesses are so located that a neutral axis of the transducer supported in the recesses is substantially parallel to lengthwise and transverse directions of the connecting members. The measuring direction is substantially normal to the neutral axis whereby a load applied to the movable member causes tensioning of each of the connecting members.



3,824,847

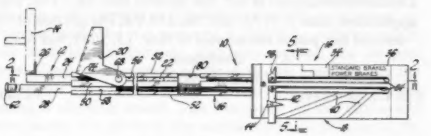
AUTOMOTIVE BRAKE TESTER ASSEMBLY

Marshall R. Chambers, 2271 Golfview, Troy, Mich. 48084

Filed Aug. 3, 1972, Ser. No. 277,725

Int. Cl. G01l 5/22

U.S. Cl. 73—132 **20 Claims**



An automotive brake tester assembly including a housing with a force applying pedal attached thereto. A brake pedal contact member is slidably disposed in and extends from the housing. A floor board contact member is slidably disposed in and extends from the housing. Scales are disposed on a plate attached to the housing with the first scale indicating the amount of brake pedal travel and the second scale indicating the ratio of the distance between the pedal and floor board when the pedal is fully depressed and the distance between the brake pedal and the floor board when the brake pedal is in the non-depressed position. A first indicator means is connected to the pedal contact member and is movable along the first scale and a second indicator means is connected to the floor board contact member and is movable along the second scale. There is also included a flag connected to the pedal contact member and movable out through an opening in the housing when a predetermined force is being applied to a brake pedal, the predetermined force resulting from depression of a spring which reacts between the pedal contact member and the housing to urge the pedal contact member out of the housing.

3,824,848

TWO SENSOR TORQUE MEASURING APPARATUS WITH COMPENSATION FOR SHAFT MISALIGNMENT

James R. Parkinson, R.D. No. 5, Vergennes, Vt. 05491

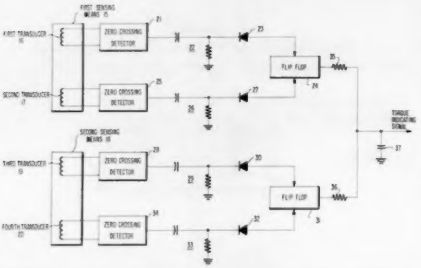
Filed June 27, 1972, Ser. No. 266,628

Int. Cl. G01l 3/10

U.S. Cl. 73—136 A **11 Claims**

A phase displacement torque measuring apparatus which compensates for any phase shift introduced in the output of a

first sensing means by the misalignment of the shaft with respect to the first sensing means by utilizing a phase shifted



signal from a second sensing means to compensate for the erroneous phase shift.

3,824,849

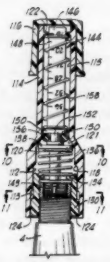
INFLATION DEVICE

Ollie C. Foxhall, Bethany, Okla., assignor to Joco, Incorporated, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 99,631, Dec. 18, 1970. This application June 5, 1972, Ser. No. 259,932The portion of the term of this patent subsequent to Mar. 13, 1991, has been disclaimed.

Int. Cl. B60c *23/04*

U.S. Cl. 73—146.8 **3 Claims**



A tire pressure indicator and inflation device which includes an outer housing having a bore and counterbore formed therein, and an internal housing or sleeve assembly positioned in the bore of the outer housing. The internal housing or sleeve assembly has a threaded hollow interior for connecting the internal housing assembly to the valve stem of a pneumatic tire. The internal housing assembly has an end plate which extends across and closes one end thereof and which carries a valve core depressor element. An elongated pressure indicator element carrying a piston at one end thereof is slidably mounted within the counterbore of the outer housing so that the piston seals against the internal wall of the outer housing in the counterbore. The piston and associated pressure indicator element are biased by a spring positioned between the piston and an internal shoulder on the outer housing to a position adjacent the internal housing.

3,824,850

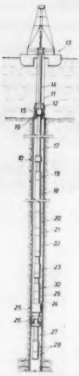
PRESSURE CONTROLLED TEST VALVE SYSTEM FOR OFFSHORE WELLS

Benjamin P. Nutter, Bellville, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Nov. 17, 1971, Ser. No. 199,554

Int. Cl. E21b *47/00*

U.S. Cl. 73—151 **32 Claims**



Methods and apparatus for performing a drill stem test of an offshore well utilizing a pressure controlled test valve. The test valve includes a valve element having a transverse pressure area with the high pressure side exposed to the pressure of fluids in the well annulus and the low pressure side subject to the pressure of a compressible fluid medium contained within a chamber in the test valve. The pressure in the chamber is equalized with the hydrostatic head of the well fluids so that at test depth the same pressure is acting on both sides of the transverse pressure area, whereupon this pressure is confined within the chamber. Then a fluid pressure in excess of the hydrostatic head is applied to the well fluids externally of the test valve to develop a pressure difference across the valve element which causes it to shift from closed to open position.

3,824,851

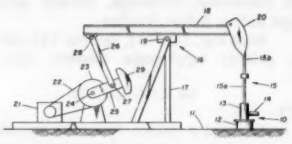
AUTOMATIC DATA RETRIEVAL SYSTEM FOR PUMPING WELLS

James L. Hagar, Oklahoma City, and Harold E. Schwartz, Jr., Norman, both of Okla., assignors to Mobil Oil Corporation, New York City, N.Y.

Filed June 1, 1972, Ser. No. 258,756

Int. Cl. E21b *47/00*

U.S. Cl. 73—151 **11 Claims**

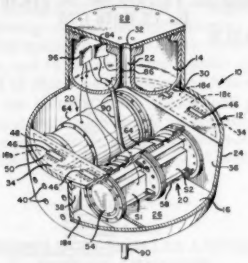


Measurements of the load conditions on a plurality of pumping wells are made by strain gauges mounted on the pumping wells. A field-located remote terminal unit is connected to each of the plurality of pumping wells. Upon command from a centrally located computer, the remote terminal unit stores the load condition measurements from a pumping well selected by the computer. At some later time the computer retrieves the load condition measurements stored in the remote terminal unit.

3,824,852
ELECTRICALLY POWERED SUBMERGED PUMP, POWER CIRCUIT THEREFOR, AND OCEANOGRAPHIC MONITORING APPARATUS AND METHOD EMPLOYING SAME

Carl L. Otto, Lummi Island, Wash. 98262

Filed Feb. 17, 1972, Ser. No. 227,075
Int. Cl. G01d *21/00*; **B63b** *59/00*; **F04b** *17/04*
U.S. Cl. 73—170 A **43 Claims**



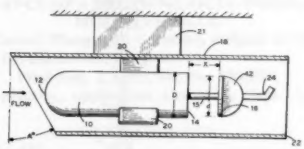
A submerged unit adapted to monitor water conditions several miles from shore, with a housing having a float chamber, a water monitoring section and plurality of reciprocating pumps to move ambient water through the monitoring section. Solenoid type units drive the pumps to move sample water past sensors in the monitoring section and provide inertial masses to vibrate the entire unit both laterally and rotationally to minimize attachment of marine organisms thereto. The power units also provide a constant flushing of screened inlet openings through which the sample water passes so as to prevent clogging thereof by marine organisms or debris.

The two power units oscillate 90° out of phase through two sets of two solenoids, one set for each power unit. This is accomplished by circuitry distributing successive half waves of an alternating current supply to the solenoids in sequence. Each solenoid is energized through an electronic valve receiving gated power through another solenoid, the gating being through a capacitor and diode whereby the capacitor is initially rapidly charged and then discharged slowly enough to prevent or block regating until occurrence of a subsequent half wave, the blocking action being reinforced by the voltage drop occurring across the other solenoid, which in the meanwhile has been preferentially gated.

3,824,853
AIRCRAFT INSTRUMENT SHROUD

Roger Mahon, New Brunswick, N.J., assignor to American Standard Inc., New York, N.Y.

Filed Aug. 13, 1970, Ser. No. 63,514
Int. Cl. G01p *5/00*; **G01f** *1/00*
U.S. Cl. 73—181 **2 Claims**

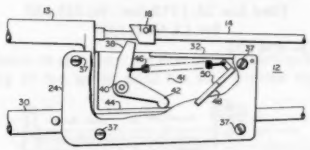


The angle of attack effects on the primary sensing element of an aircraft altitude/airspeed measuring instrument are minimized and controlled by means of a shroud device having a particular inlet shape which surrounds and isolates such sensing element. The primary element includes an upstream cylindrical member and a downstream disc-like member spaced from the cylindrical member by a predetermined distance. Fluid parameter fluctuations are produced in the airstream behind the cylinder-disc structure which are directly related to true airspeed. The measured fluctuation frequency, however, is also influenced by the angle of attack of the aircraft. This latter effect constitutes a source of instrument error which the shroud device minimizes and controls.

3,824,854
SOUND TRIM APPARATUS FOR BOAT SPEEDOMETER

Albert Weinstein, Alexandria, Va., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 23, 1973, Ser. No. 344,324
Int. Cl. G01c *21/10*
U.S. Cl. 73—185 **8 Claims**

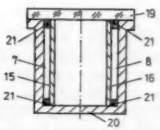


The sound generating device is mounted on a boat responsive to a shaft rotating at a speed proportional to the speed of the boat. Fixed to the shaft is a cam. Upon each rotation of the shaft, the cam engages a trip hammer which is mounted on support means. The trip hammer is biased by a spring which tends to hold the hammer stationary against the support means. Upon each rotation of the shaft, the cam engages the trip hammer causing it to rotate against a strike plate, thereby creating a clicking sound. The frequency of the clicks and consequently the pitch of the sound varies directly with the speed of the boat, thereby giving an indication of the speed and the change in speed without requiring the operator to divert his attention to look at a speedometer dial.

3,824,855
METHOD AND APPARATUS FOR MEASURING THE FLOW RATE OF FLUIDS SUCH AS GASES OR LIQUIDS

Manfred Heckle, Max-Wolf Str. 16, D-69 Heidelberg, Germany

Filed Jan. 14, 1972, Ser. No. 217,754
Claims priority, application Germany, Jan. 25, 1971, 2103248; Mar. 11, 1971, 2111627; July 15, 1971, 2135310
Int. Cl. G01f *1/00*; **G01p** *5/10*
U.S. Cl. 73—194 B **29 Claims**



This invention relates to a method and apparatus for measuring the flow rates of liquids or gases. The method essentially comprises the steps of directing the fluid past an element which can oscillate transversely of the fluid flow, said element being normally biassed into the fluid flow, and measuring the oscillation frequency of said element to give the flow rate of the fluid. One form of apparatus for use in carrying out the method of the invention comprises a chamber through which the fluid can flow, a duct leading into said chamber for in-

troducing the fluid into the chamber, an oscillatory element having at least a portion disposed in said chamber and being movable by the fluid flow transversely thereof about an axis offset with respect to the fluid flow. The fluid flow can be split into two or more separate flow paths. If this is done the apparatus comprises a collecting chamber through which the fluid can flow, a fluid inflow chamber to divide the fluid flow into at least two separate flow paths, conduits leading from said inflow chamber to said collecting chamber, each of said conduits having an outlet aperture in said collecting chamber, an oscillatory element mounted in said collecting chamber for movement transversely with respect to the fluid flow paths, and said element having portions which are acted on by the flow paths to cause the element to oscillate.

3,824,856

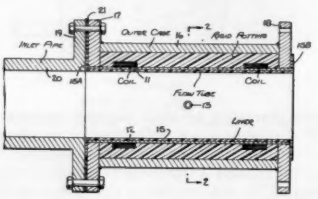
HIGH-PRESSURE ELECTROMAGNETIC FLOWMETER

John S. Yard, Warminster, Pa., assignor to Fischer & Porter Co., Warminster, Pa.

Filed Jan. 22, 1973, Ser. No. 325,633

Int. Cl. G01f *1/00*

U.S. Cl. 73—194 EM **6 Claims**



An electromagnetic flowmeter having a thin-wall, non-magnetic flow tube surrounded by coils to establish an electromagnetic field in the flow passage. A heavy-wall case is supported concentrically with respect to the flow tube to define an annular region occupied, in part, by the coils and filled with a rigid potting compound, whereby the thin-wall flow tube which minimizes eddy current losses and satisfies the requirement for electromagnetic efficiency, is physically reinforced by the case and is rendered capable of withstanding heavy fluid pressures.

3,824,857

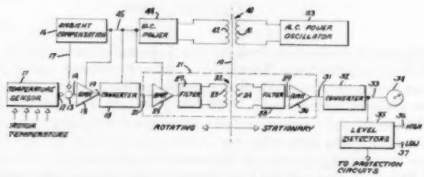
TEMPERATURE MEASURING SYSTEM FOR ROTATING MACHINES

Forest D. Smith, Saint Louis Park, Minn., assignor to Electric Machinery Mfg. Company, Minneapolis, Minn.

Filed Aug. 7, 1972, Ser. No. 278,578

Int. Cl. G01d *5/12*

U.S. Cl. 73—351 **8 Claims**



A temperature measuring system for measuring the rotor temperature of an electric motor or generator. A temperature signal from a thermocouple mounted on the rotor is amplified and used to run a voltage to frequency converter which generates a signal having a frequency proportional to the temperature. This signal is coupled from the rotating portion to the stationary portion of the machine where it is converted to an analog voltage proportional to the rotor temperature. In one embodiment a rotary transformer is used to couple the signal from the rotating portion to the stationary portion of the machine, while in another embodiment an FM transmitter and receiver is used for the signal coupling.

3,824,858

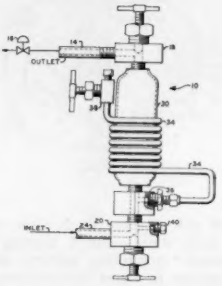
FLUID SAMPLING APPARATUS

J. Gordon Erdman, Bartlesville, Okla., assignor to Phillips Petroleum, Bartlesville, Okla.

Filed Dec. 13, 1972, Ser. No. 314,567

Int. Cl. G01n *1/10*

U.S. Cl. 73—421 R **8 Claims**



A representative sample of a liquid under elevated pressure and containing at least one component which would be a gas at a lower pressure is obtained by the introduction of a sample thereof at about said elevated pressure into a major cavity section of a sample container. A contaminant-free minor cavity section of said container is separated from said major cavity section by means of a partition which is rupturable at a pressure above said elevated pressure but below the rupture pressure for the remainder of the container.

3,824,859

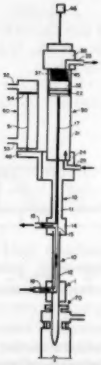
AUTOMATIC FLUID INJECTOR

Rano J. Harris, Sr., 1945 Carolyn Sue Dr., and Rano J. Harris, Jr., 9880 S. Riverooks Dr., both of Baton Rouge, La.

Continuation-in-part of Ser. No. 223,663, Feb. 4, 1972, Pat. No. 3,754,443. This application Feb. 16, 1973, Ser. No. 333,120

Int. Cl. G01n *1/14*

U.S. Cl. 73—422 GC **9 Claims**



An apparatus for accurately measuring and injecting quantities of fluid specimens, or samples, as received from a flowing

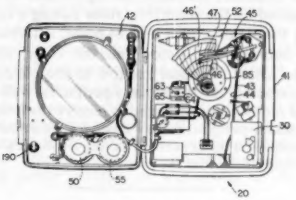
sampled stream, into various media, e.g., a receptacle or inlet of a modern analytical instrument. The automatic fluid injector, or continuous flow analyzer, is comprised generally of (a) a support means, (b) a tubular mounting member, generally mounted on said support means, said member providing an axial opening which can be aligned upon said inlet, and including a transverse opening entering therein through which fluid can be transferred from a flowing stream, (c) a needle syringe, including a barrel and a plunger reciprocable within the barrel and bore of a needle, mounted on the forward end of the syringe, for insertion into the axial opening and for alignment of a side opening provided in the needle for alignment with the transverse opening of the tubular mounting member for receipt of a fluid specimen into the needle bore on withdrawal of the plunger, and (d) an associated cylinder piston unit, the needle syringe of which is mounted on the forward end of the piston. Both the plunger of the syringe and piston of the cylinder piston unit are reciprocable, on actuation in response to automatic control means to accurately measure, trap and then inject fluid specimens from the flowing stream, as desired.

3,824,860

TIME SCHEDULE CONTROLLER AND PARTS AND HOUSING THEREFOR

George T. Hardin, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 187,641, Oct. 8, 1971, Pat. No. 3,730,427.
This application Feb. 20, 1973, Ser. No. 333,531
Int. Cl. G01p 1/06
U.S. Cl. 73—431 **5 Claims**



A time schedule controller wherein the high limit index and the set point index respectively have members movable therewith and alignable in relation to each other only when the set point index reaches the setting of the high limit index. An actuator for terminating the operation of the set point index in the rate of rise thereof is only actuated when the alignable members of the high limit index and the set point index that are operatively associated therewith are in their aligned relation thereof.

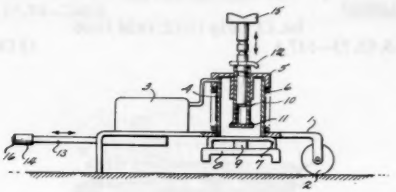
3,824,861

APPARATUS FOR DETECTING AND MEASURING IMBALANCE OF A MOTOR VEHICLE WHEEL ON A MOTOR VEHICLE

Eickhart Goebel, Pfungstadt, Germany, assignor to Gebr. Hofmann, KG., Darmstadt, Germany

Filed Aug. 2, 1973, Ser. No. 384,898
Claims priority, application Germany, Sept. 19, 1972, 7234410
Int. Cl. G01m 1/28
U.S. Cl. 73—457 **3 Claims**

Apparatus for measuring imbalance of a motor vehicle wheel with a frame, a first cylinder mounted on the frame for movement with respect to the frame and having a stop portion for engaging the ground in one position and the frame in a second position, a spring about the first cylinder urging it upwards, a second cylinder mounted for movement within the first cylinder and engaging the wheel when forced upward by



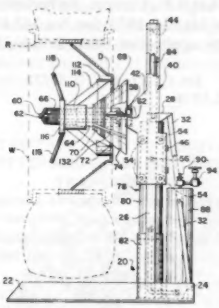
fluid pressure to also force the first cylinder downward against the urging of the spring until the stop portion engages the ground.

3,824,862

WHEEL BALANCING APPARATUS

Charles Earl Branick, 1601 S. 9th St., Fargo, N. Dak. 58102

Filed Dec. 21, 1972, Ser. No. 317,402
Int. Cl. G01m 1/02
U.S. Cl. 73—480 **18 Claims**



Wheel balancing apparatus especially useful for static balancing of truck tires of various standard sizes including a carrier mounted for vertical movement upon a stationary base frame and a spindle freely rotatably mounted on the carriage about a horizontal axis for carrying a mounting cone having a plurality of circumferential grooves of diameters corresponding to those of the central openings of standard sized disc type truck wheels. A clamping ring assembly slidably mounted on the spindle is urged by a clamping nut axially of the spindle into engagement with a wheel disc to seat and retain the wheel in position on the appropriate groove in the cone. The carriage is movable vertically by a fluid motor for firstly enabling relatively heavy truck wheels to be mounted upon the spindle while the wheel is resting on the floor and thereafter for elevating the wheel clear of the floor for the balancing operation. An adapter assembly may be provided for balancing rim mounted wheels.

3,824,863

ELECTRICAL TRANSDUCER

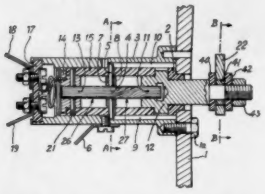
Louis Monpetit, L'Etang-Ville, France, assignor to Societe Des Proceedes Modernes D'Injection Sopromi

Filed Feb. 16, 1973, Ser. No. 333,034

Claims priority, application France, Feb. 23, 1972, 72.06043

Int. Cl. G01p *15/12*; F02d *35/00*

U.S. Cl. 73—517 A 12 Claims



An electrical transducer which is responsive to sudden movements to produce an electrical signal, the transducer including an element whose electrical resistance is changed upon the application of a force, such as torsion, with the change in resistance used to operate an electronic circuit.

3,824,864

BELT DRIVES

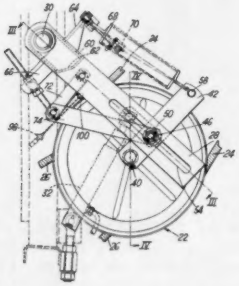
Jean Calude Muller, Palaiseau, France, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed May 24, 1973, Ser. No. 363,678

Claims priority, application Great Britain, June 14, 1972, 27751/72

Int. Cl. F16h *7/10*, *55/22*

U.S. Cl. 74—242.15 R 10 Claims



Belt tension control apparatus having a pulley mounted at one end of a lever arm. The arm is connected at its other end to a coiled tension spring and pivotally mounted between its ends on a support. The position of the pivot along the support may be adjusted. Decrease in belt tension resulting from belt stretch is indicated visually by angular movement of the arm from a reference position at right angles to the support. After position adjustment of the pivot to restore the arm to its reference position following belt stretch, the degree of extension of the spring is greater than before the stretch occurred.

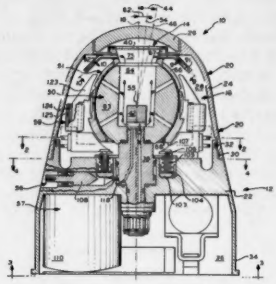
3,824,865

PROJECTILE HAVING A GYROSCOPE

John L. Evans, Oakland; C. John DeCotiis, Cranford, and Victor P. Johnson, Fair Lawn, all of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Sept. 21, 1972, Ser. No. 290,856

U.S. Cl. 74—5.6 D 7 Claims



A projectile including, a housing, an optical tracker, and a gyroscope disposed within the housing, the housing having a nose section and a base section forming a chamber enclosing the tracker and the gyroscope, the nose section having a window, the optical tracker having an optical lens unit and an image detector unit mounted on the gyroscope, the optical unit being arranged to receive an image through the window and to transmit the image to the image detector unit, the gyroscope comprising, a stator mounted on the base section within the chamber, the stator having a stator axis, a hollow rotor mounted on the stator, the rotor having a rotor axis intersecting the stator axis at a pivot point, anti-friction means disposed between the stator and the rotor, drive means adapted to rotate the rotor relative to the stator about the rotor axis, wherein the stator has a peripheral wall enclosing a recess, the recess being arranged to receive the image detector unit, the stator peripheral wall having a spherical outer surface, the spherical outer surface having a spherical center substantially coinciding with the pivot point.

3,824,866

APPARATUS FOR GENERATING A WOBBLE MOTION

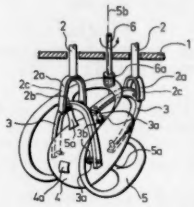
Paul Schatz, Raengartenweg 11, 4143 Dornach/So/, Switzerland

Filed Apr. 16, 1973, Ser. No. 351,337

Claims priority, application Switzerland, Apr. 19, 1972, 5818/72

Int. Cl. F16h *33/00*

U.S. Cl. 74—61 8 Claims



An apparatus for generating a wobble motion with a wobble body is disclosed. An endless band is secured to the wobble body for transmitting motion thereto. The endless band is formed of a flat circular ring band which is bent about axes

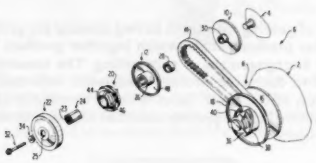
parallel to two perpendicular diameters. In position, the endless band includes a symmetry plane which extends through one of the body suspension means. A drive mechanism secured to a frame imparts motion to the wobble body via the endless band. The wobble body is rotatably secured to a frame by suspension means.

3,824,867

MULTI-STAGE CONTROL FOR TORQUE CONVERTERS IN ENGINE DRIVEN VEHICLES

John Hawley Brooks, Encino, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.

Filed Dec. 7, 1972, Ser. No. 312,912
Int. Cl. F16h *55/52*
U.S. Cl. 74—230.17 E 22 Claims



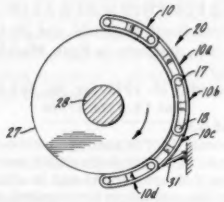
A method and apparatus wherein a variable sheave V-belt torque converter, particularly suitable for use with engine driven vehicles such as snowmobiles or the like, is controlled so that a wider spread is obtained between the engine speed at the time of belt engagement and the engine speed at the time of completion of the shift. Belt engagement occurs at an engine speed relatively close to idle speed, and shifting operations are delayed until about a speed corresponding to that of maximum engine torque. Completion of shifting occurs at about a speed corresponding to the speed of maximum engine power. This belt engagement and shifting control, which improved acceleration and climbing ability of an engine driven vehicle such as a snowmobile, is provided through multi-stage resilient control of the operation of centrifugal clutch shoes engageable with the movable pulley section of the torque converter. Such control may be accomplished through the use of a plurality of garter springs, or a plurality of compression springs.

3,824,868

HIGH TEMPERATURE BELT LINK CONSTRUCTION

Francis M. Fahrenwald, Chicago, Ill., assignor to The Fahralloy Company, Harvey, Ill.

Filed May 7, 1973, Ser. No. 357,546
Int. Cl. F16g *12/40*
U.S. Cl. 74—235 14 Claims



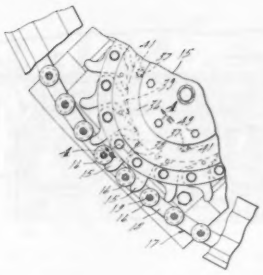
A high temperature conveyor belt, and a belt link for use therein, of the type used in heat treat furnaces in which excessive deformation of the link, with consequent interference in flexing action, and premature failure due to shrinkage defects is substantially eliminated by use of a protuberance within the link which limits link deformation and ensures internally sound metal.

3,824,869

CHAIN DRIVE HAVING PIVOTED DRIVE TEETH

Prescott V. Murphy, Kearny, N.J., assignor to Standard Tool & Manufacturing Co., Lyndhurst, N.J.

Filed Sept. 25, 1972, Ser. No. 291,977
Int. Cl. F16h *55/30*
U.S. Cl. 74—243 R 8 Claims



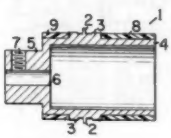
A sprocket wheel is employed to drive a chain having cylindrical rollers separated by overlapping links secured to the roller pivots. The radius of the wheel is small when compared to the radius of the chain or a straight section thereof where the teeth contacts the chain rollers to produce the driving thereof. Individual teeth are equally spaced when pivoted around the edge of a wheel having a central drive shaft. The teeth project between two chain rollers with the engaging tooth face having an arcuate form to mate with the advanced roller. The wheel is mounted adjacent to a fixed cam that has a section of uniform radius to maintain the teeth in driving relation and a section of less radius forming a drop-off portion where the teeth leave the chain which progressively extends outwardly to blend in with the section of uniform radius where the teeth are moved outwardly in position to again engage a roller on the chain.

3,824,870

COMPUTER TAPE SPROCKET DRIVE WITH 40 PERCENT PIN AND 60 PERCENT FRICTIONAL TRANSMISSION

Robert E. Yablonski, Orange; George S. Hager, Anaheim, and William G. Campbell, Jr., Orange, all of Calif., assignors to Electronic Engineering Co. of Calif., Santa Ana, Calif.

Filed Jan. 15, 1973, Ser. No. 323,567
Int. Cl. F16h *55/40*
U.S. Cl. 74—243 R 10 Claims



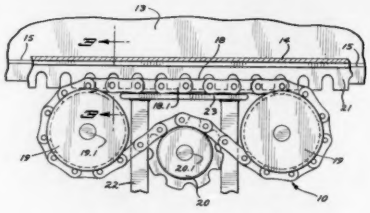
A sprocket for translating perforated tape by means of a ring of pins and at least one cylindrical elastomer sleeve adjacent to the pins. Translational forces are exerted upon the perforations of the tape by the pins and upon one surface of the tape by contact with the elastomer. This structure gives a very much longer accurate tape life by reducing sprocket hole damage, particularly where frequent starts and stops are involved.

3,824,871

DRIVE FOR BUNK FEEDER

Leo J. Loesch, and Claude E. Loesch, both of Kimball, Minn. 55353

Filed Feb. 22, 1973, Ser. No. 334,587
Int. Cl. F16h 19/06, 1/04
U.S. Cl. 74—422 7 Claims



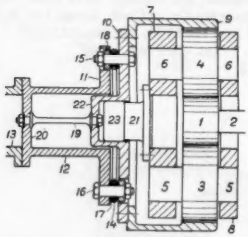
A drive producing the lineal motion of a slide and particularly a sliding pan of a bunk feeder, the drive includes an endless roller chain, a rack affixed to the sliding part and meshed with and driven by the roller chain, the roller chain having a drive run extending linearly between spaced guide rolls and meshed with the rack, the roller to roller pitch length of the chain slightly exceeding the tooth to tooth pitch length of the rack.

3,824,872

EPICYCLIC GEAR

Jan Stolt, and Christer Gerward, both of Vasteras, Sweden, assignors to Stal-Laval Turbin AB, Vesteras, Sweden

Filed Oct. 16, 1972, Ser. No. 297,649
Claims priority, application Sweden, Oct. 18, 1971, 13140/71
Int. Cl. F16h 57/00
U.S. Cl. 74—411 3 Claims



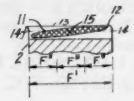
An epicyclic gear train, comprising a sun-wheel and an outer internally toothed gear ring both in engagement with star wheels which are mounted on a carrier; the outer gear ring and its shaft being connected through a cardan joint for the purpose of preventing external angular motion from disturbing the axial alignment of the shafts of the sun-wheel and the outer gear ring. The cardan joint comprises a laminated ring coupling fastened between a flange on the outer gear ring and a flange on its shaft.

3,824,873

ROLLING CONTACT GEARING

William S. Rouverol, Boite Postale No. 8, 20-Saint Florent, Corse, France

Filed Dec. 18, 1970, Ser. No. 99,587
Int. Cl. F16h 55/06
U.S. Cl. 74—462 55 Claims



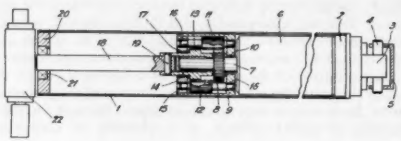
A form of gearing with teeth having circular arc profiles and a particular pressure angle which together produce engagement and disengagement in pure rolling. The shearing action tangential to the tooth profiles associated with compressive deformation of the tooth faces is made to exactly offset the shearing action in the opposite direction imposed by the meshing of the teeth.

3,824,874

DRIVING DEVICE FOR A TUBULAR AXLE

Claude Georges, Gray, France, assignor to Societe Industrielle Du Metal Usine, Arc-les-Gray, Haute Saone, Japan

Filed May 4, 1973, Ser. No. 357,379
Claims priority, application France, May 18, 1972, 72.17833
Int. Cl. F16h 36/00
U.S. Cl. 74—626 3 Claims



A driving device for a tubular axle containing an electric motor and provided with a hand drive gear wherein the electric motor and the hand drive gear engage respectively two elements of a differential gear, the cage of which is fixed to the tubular axle.

3,824,875

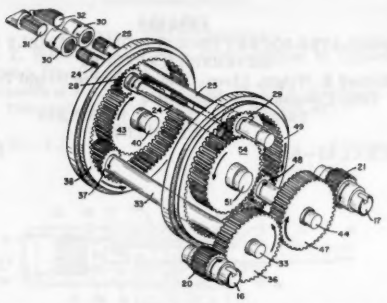
DRIVE FOR TWIN SCREW EXTRUDER

William H. Willert, North Plainfield, and Jai G. Ro, Flemington, both of N.J., assignors to Egan Machinery Company, Somerville, N.J.

Filed May 21, 1973, Ser. No. 362,178
Int. Cl. F16k 37/06
U.S. Cl. 74—665 GA 12 Claims

Drive apparatus for imparting rotation in opposite directions to a pair of output shafts which are rotatable about longitudinal axes that are parallel and in close proximity to each other. The drive apparatus is comprised of a first train of pinions and gears, including an input pinion rotatable with an input shaft, a first intermediate gear that meshes with the input pinion and is mounted on a shaft which is provided with a drive pinion that meshes with a planetary ring gear and with a sun gear within the confines of the ring gear, and an output pinion that meshes with the sun gear and with the ring gear and is rotatable with one of the output shafts. The drive apparatus is also comprised of a second train of pinions and

gears which is similar to the first train and includes a second intermediate gear that meshes with the first intermediate gear and an output pinion that is rotatable with the other output



shaft. The pinion and gear trains are actuated simultaneously and in unison by a single prime mover connected to the input shaft of one of the trains or by a pair of prime movers, each of which is connected to the input shaft of a corresponding train.

3,824,876

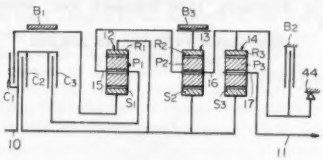
GEAR TRAIN WITH THREE PLANETARY GEAR SETS

Yoichi Mori, Yokohama; Nobuo Okazaki, Chigasaki; Kunio Ohtsuka, and Tetsuya Iijima, both of Tokyo, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan

Division of Ser. No. 30,496, April 21, 1970, Pat. No. 3,701,293. This application Sept. 13, 1972, Ser. No. 288,549

Int. Cl. F16h *57/10*

U.S. Cl. 74—759 **4 Claims**



Gear train arrangements for transmitting a power from a driving source to a driven member at more than three speeds in one direction and another speed in the opposite direction, the gear train arrangements using basically three planetary gear sets and at least five friction elements such as clutches and brakes which are selectively actuated to selectively engage the rotary members of the three planetary gear sets to deliver an output power at the above said speeds. The gear train arrangements are specifically adapted for use in an automatic transmission system of a motor vehicle using a torque converter or fluid coupling.

3,824,877

INDEXING WORKPIECE SUPPORTING APPARATUS

Jack Mazue, Saone-et-Loire, Mercurey, France

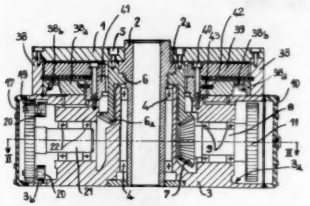
Filed Sept. 4, 1973, Ser. No. 394,099

Claims priority, application France, Sept. 7, 1972, 72.32334

Int. Cl. B23b *29/32*

U.S. Cl. 74—814 **10 Claims**

The rotatable table of the indexing workpiece supporting apparatus is carried by a vertical shaft which is rotatably mounted within a lower casing. This shaft is connected by bevel gears with a first inner shaft radially disposed within the casing with respect to the vertical shaft, this first inner shaft being in turn connected by interchangeable spur gears with a second inner shaft laterally situated with respect to the vertical shaft. A Geneva cross gearing connects this second inner shaft with a third one disposed in line with respect to the first inner shaft, but on the other side of the vertical shaft. This third shaft is in turn connected with a fourth shaft parallel to the second inner shaft, but situated on the other side of the



vertical shaft, and this fourth shaft is driven by means of a vertical worm, the lower end of which projects below the casing to form an inlet shaft, and of a corresponding worm mounted loose on the said fourth shaft, but angularly retained thereon by a torque limiting coupling. The interchangeable gears and the Geneva cross gearing are disposed in opposed lateral recesses of the casing and are easily accessible through removable covers.

3,824,878

DEVICE FOR AUTOMATICALLY CONTROLLING A GEARBOX

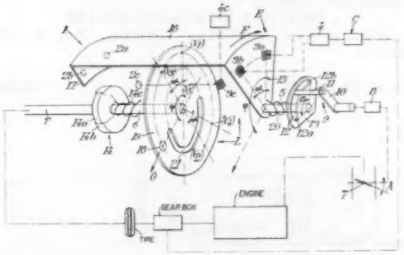
Albert Grosseau, Chaville, France, assignor to Societe Anonyme Autmobiles Citroen, Paris, France

Filed Mar. 27, 1972, Ser. No. 238,109

Claims priority, application France, Apr. 5, 1971, 71.11921

Int. Cl. B60k *19/00*; G01d *5/34*

U.S. Cl. 74—866 **10 Claims**



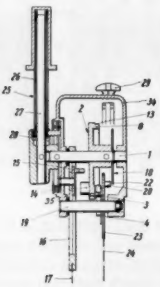
A device comprising means capable of emitting an electrical signal and means responsive to said signal and adapted to command a change of gear. The means capable of emitting the signal include a light source which can be caused to communicate with a receiver element capable of triggering the electrical signal, and two rotatable shafts, the angular amplitudes of whose rotations depend respectively on engine operating parameters. The two shafts cooperate with means for causing the light emitter and receiver to communicate. Application to the control of an automobile gearbox.

3,824,879

ACTUATOR FOR MULTIPLE ACTION REMOTE CONTROL OF A SHIPS DRIVE SYSTEM

Klaus Hansgen; Gerhard Ridder, both of Witten, and Bernd Schuhmann, Dortmund, all of Germany, assignors to Mannesmann-Meer Aktiengesellschaft, Monchengladbach, Germany

Filed Apr. 16, 1973, Ser. No. 351,643
Claims priority, application Germany, Apr. 18, 1972, 2219486
Int. Cl. B60k *23/00*
U.S. Cl. 74—878 5 Claims



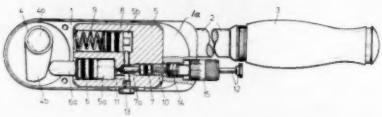
An actuator for speed and directional control of a ships drive and gearing system wherein a single handle-lever turns a control shaft with a control disk coupled to a follower disk and when in one axial position only, for the directional control of the gear, while in either axial position the control disk is coupled to the speed control but only after a limited turning range has been traversed by the handle, which turning range is the one within which the direction control is carried out. The control disk and the follower control disk are coupled for limited range engagement by a single cam pin on the control disk means and a pair of teeth engaging that pin until rotation causes the latter to escape.

3,824,880

DEVICE FOR LIMITING A FORCE TO BE CONVEYED BY A LEVER EFFECT

Hermann Jochen Zerver, Reinshagener Str. 2, 5630 Remscheid, Germany

Filed July 3, 1973, Ser. No. 376,129
Claims priority, application Germany, July 5, 1972, 2232872
Int. Cl. B25b
U.S. Cl. 81—52.4 R 10 Claims



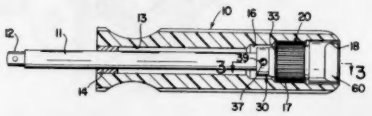
A device for limiting a force to be conveyed by a lever effect, especially torque wrench, with a handle having one end thereof provided with a support for the tool to be actuated, which support is rotatably or pivotably mounted, while a coupling connects the tool support to the handle until an adjustable force has been realized, whereupon after the set force has been exceeded a turning or pivoting of the tool support will occur. The coupling includes a hydraulic piston arrangement which comprises a main piston operable by the tool support or tool carrier, a control piston which against the thrust of a variable control spring is operable by pressure fluid displaced by the main piston, and a compensating piston which after a control bore is freed is displaced by the main piston against the thrust of a return spring.

3,824,881

INSULATED SOCKET TOOL HANDLE ASSEMBLY WITH REVERSIBLE RATCHET

Richard B. Wright, Akron, Ohio, assignor to Wright Tool and Forge Company, Barberton, Ohio

Filed Sept. 19, 1973, Ser. No. 398,653
Int. Cl. B25b *13/46*
U.S. Cl. 81—63 1 Claim



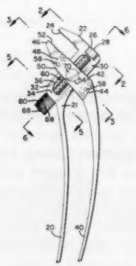
An electrically insulated spin-drive handle assembly with a reversing ratchet drive, adapted for use with various socket heads. Within the handle are internal ratchet teeth engagable by a double pawl element carried by a rotatably mounted pawl carrier. A socket stem is connected by a transverse pin to the pawl carrier and extended through and beyond the handle to receive various socket heads. The double pawl element is selectively urged to either forward-drive or reverse-drive engagement with the ratchet teeth using a selector cap recessed in the rearward end of the handle. The selector cap is formed of dielectric material so that a forward or reverse selection can be made for the ratchet mechanism manually without danger of electrical shock.

3,824,882

ADJUSTABLE SCREW-LOCK PLIERS

Charles J. Burthardt, 1800 Elizabeth Ave., Metairie, La. 70003

Filed May 4, 1972, Ser. No. 250,091
Int. Cl. B25b *7/10*
U.S. Cl. 81—401 1 Claim



A relatively stationary handle having a jaw structure normal to a longitudinally slotted structure that fits between the sides of a second slotted structure in a relatively movable handle having a second jaw structure parallel to said first jaw structure, said respective slots being adapted to normal intersection when said jaw structures are parallel. A cylindrical pivot block, diametrically tapped and passing transversely through the respective slotted structures, pivots the handles together and engages in said tap a threaded screw structure journaled in said first slotted structure of the relatively stationary handle, said screw structure extending through the handle end of said slot to engage a knurled thumb nut, the turning of which

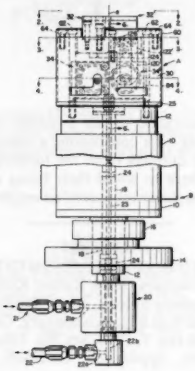
slidably opens said jaw structures, which are also pivotally openable around said pivot block by said relatively movable handles.

3,824,883

CUTTING HEAD ASSEMBLY

Joseph T. Wloszek, Seven Hills, Ohio, assignor to Custom Machines, Inc., Cleveland, Ohio

Continuation of Ser. No. 102,360, Dec. 29, 1970, abandoned.
This application Feb. 8, 1973, Ser. No. 330,487
Int. Cl. B23b *3/26*
U.S. Cl. 82—1.2 **9 Claims**



A cutting head assembly especially suited for use on lathes or boring mills for performing facing operations. The cutting head assembly includes a tool carrier in the form of a generally cylindrical body adapted to be mounted on the end face of a conventional spindle with its axis aligned with the axis of rotation of the spindle. A pair of cutters are mounted on slide members carried in a slideway formed transversely in the outer end face of the body. The slides are arranged for movement along parallel chordal lines equally spaced from the axis of the body and are interconnected through rack gears and a pinion gear so that they move simultaneously an equal amount in opposite directions. Hydraulic piston units are carried in the body and are connected with the slides to drive them transversely of the body to move the cutters across the outer end face to perform the required cutting during rotation of the body about its axis.

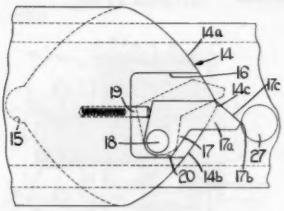
3,824,884

MECHANISM FOR POSITIONING A ROTATABLE SPINDLE AT A PREDETERMINED ANGULAR SETTING

Harold James Gilbert, and Malcolm Robert Holt, both of Coventry, England, assignors to Hickman Machine Tool Sales Limited, Coventry, England

Filed Mar. 22, 1973, Ser. No. 343,676
Int. Cl. B23b *19/02*
U.S. Cl. 82—30 **1 Claim**

Mechanism for positioning a spindle such for example as the work spindle of a lathe at a predetermined angular setting. The mechanism is of the kind comprising an annular cam on the spindle having two helically extending surfaces meeting in the high and low points of the cam, and a cam actuator movable longitudinally relative to the spindle onto one or other of the surfaces. Thereafter continued movement of the actuator is adapted to move the cam and spindle angularly until the actuator engages a recess in the cam at its lowest point to locate the spindle against further angular movement. The mechanism is characterised by a lever pivotally mounted within a recess in the cam and urged angularly by resilient means into contact with a stop. The lever has a nose extending from the cam and terminating in a tip which is offset with respect to both the high point of the cam and the pivot axis of the lever. The arrangement is such that should the actuator first contact one side of the lever the lever will act as an extension of the cam to



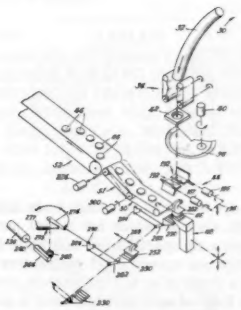
enable the actuator to move down this side of the lever whilst moving the cam angularly until the actuator reaches one of the aforesaid surfaces of the cam. However, in the event of the actuator first contacting the tip or other side of the lever the lever will move angularly against the resilient means to enable the actuator to contact the other surface of the cam.

3,824,885

METHOD AND APPARATUS FOR PRODUCING WEIGHT CONTROLLED GROUPS OF SLICED FOOD PRODUCT

Robert Howard Marshall, Hinsdale, and Gary Leonard Wallace, Oak Lawn, both of Ill., assignors to Chemetron Corporation, Chicago, Ill.

Filed Sept. 28, 1972, Ser. No. 293,045
Int. Cl. B26d *7/08, 4/22*
U.S. Cl. 83—19 **14 Claims**



A method and apparatus for producing weight controlled stacks of counted slices cut from an elongated mass of food product includes means for feeding the mass longitudinally along a downward feed path into a cutting path normal thereto, a rotary knife movable around the cutting path to cut slices from the mass, means below the cutting path for accumulating a selected number of the slices into a group, means positioned below the accumulating means for weighing a group of slices and producing a signal in response to the weight thereof, means for removing the group from the weighing means after the signal is produced, means for varying the rotary speed of the knife around the cutting path according to the weight signal, and means for accepting or rejecting weighed groups in response to the weight signal.

3,824,886

APPARATUS FOR CUTTING APERTURES IN TUBES

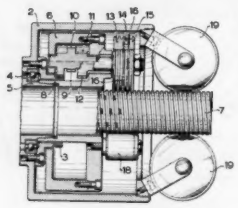
Wilhelm Hegler, Goethestr. 2, 873 Bad Kissingen, Germany

Filed Nov. 3, 1972, Ser. No. 303,449

Claims priority, application Germany, June 23, 1972, 2230767

Int. Cl. B26d *5/08*

U.S. Cl. 83—329 **11 Claims**



An improved pipe having an incised aperture wherein the length and/or width of the aperture increases from the interior surface of the pipe to the exterior thereof; a process and apparatus for cutting an aperture in the surface of a pipe in which means for revolving a cutter about the pipe to be cut are provided and means for moving the cutting surface in an epitrochoid path as it passes through the exterior surface of said pipe.

3,824,887

STAMPING KNIFE

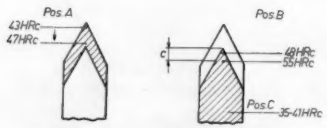
Gustav Marchard, Waidhofen/Ybbs, Austria, assignor to Gebr. Boehler Co. AG, Kapfenberg, Austria

Filed Sept. 15, 1972, Ser. No. 289,752

Claims priority, application Austria, Nov. 26, 1971, 10187/71; Germany, Oct. 22, 1971, 2152622

Int. Cl. B26f *1/44*

U.S. Cl. 83—679 **4 Claims**



A cutting edge is carried by a knife body and formed with a series of teeth, each of which has a root merging into said knife body and a tip spaced from said knife body. Adjacent ones of said tips are spaced 0.5-5 millimeters apart. Each of said teeth has a depth of up to 5 millimeters, measured from its tip to its root. Each of said teeth increases in hardness from its tip to its root. Each of said teeth has at its root at least the same hardness as the adjacent portion of said tooth body.

3,824,888

SELF-TAPPING REPLACEMENT STUD WITH CHIP COLLECTION AND STORAGE CHAMBER

Daryl G. Brooks, 5240 N. Van Ness, Fresno, Calif. 93705

Continuation-in-part of Ser. No. 156,319, June 24, 1971, abandoned. This application July 17, 1972, Ser. No. 272,376

Int. Cl. F16b *25/00*

U.S. Cl. 85—47 **6 Claims**

A self-tapping replacement stud, for use in assembled engine blocks and similar workpieces in which the original threads of a stud bore have been inadvertently stripped, including an elongated shank having opposite ends and providing screw threads circumscribing one end, a collecting bore extended through the threads transversely of the shank bounded by a cutting edge adapted to form female threads in the stud bore when rotated therein, a stud driver adapted to be releasably attached to the end of the shank opposite to the threaded end engageable with the workpiece for controlling the depth of penetration of the threaded end into the stud bore, the collecting bore constituting a chamber for receiving and retaining the cuttings from the forming of new threads within the stud bore to avoid their being dropped into the workpiece, such as the crankcase of an engine.

3,824,889

TIME FUZE ADJUSTMENT

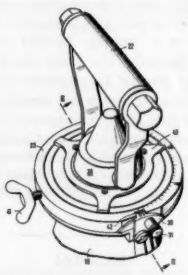
Paul Kaiser, Schramberg; Hans Kaiser, Konigsfeld, and Josef Muller, Schramberg-Sulgen, all of Germany, assignors to Firma Junghans G.m.b.H., Schramberg, Germany

Filed Jan. 2, 1973, Ser. No. 320,174

Claims priority, application Germany, Jan. 7, 1972, 2200540

Int. Cl. F42c *17/00*

U.S. Cl. 89—6 **8 Claims**



A time fuze is provided with adjustable means for setting the time delay and time range thereof. These adjustments may be made by an adjusting device in a single operation wherein the time delay is set in response to rotation of the adjusting device on the fuze, and the time range is set in response to axial movement of the adjusting device on the fuze.

3,824,890

CHIP GUARD FOR MACHINE TOOLS

William D. Zettler, and Earl E. Johnson, both of c/o Giddings & Lewis, Inc., Fond Du Lac, Wis. 54935

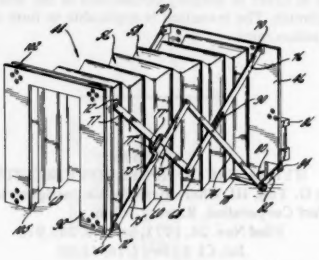
Continuation-in-part of Ser. No. 108,917, Jan. 22, 1971, abandoned. This application June 15, 1972, Ser. No. 263,322

Int. Cl. B23b *47/00;* **B23c** *9/00;* **B23q** *11/08*

U.S. Cl. 90—11 R **15 Claims**

An automatically operated chip guard arrangement is disclosed in the environment of a multi-purpose horizontal spin-

dle machine tool and is adapted to be mounted on the headstock surrounding the top and sides of the tool operator. The



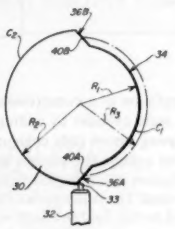
chip guard automatically extends into contact with a workpiece at the operating station and readjusts itself to changes in relative distance between the workpiece and the headstock.

3,824,891

MACHINE TOOL

Richard R. Carroll, Chagrin Falls, Ohio, assignor to Litton Industrial Products, Inc., Cleveland, Ohio

Filed May 11, 1973, Ser. No. 359,527
Int. Cl. B23b *47/06*
U.S. Cl. 90—11 A **8 Claims**



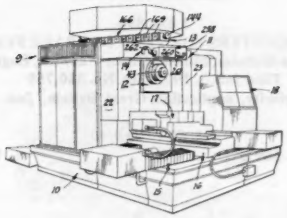
A machine tool comprising a rotatable spindle including first and second continuous track surfaces, means for reducing the speed of rotation of the spindle to at least a predetemined maximum speed, a linear variable differential transformer including, probe means advanceable from a retracted position to an advanced position where the probe means selectively engages the first and second track surfaces, means for biasing the probe means against the first and second track surfaces when the probe means is at the advanced position, and means for generating an output signal having one phase when the probe means engages one of the track surfaces and having a second phase when the probe means engages the other one of the track surfaces, reversible motor means for driving the spindle, signal conditioner means for receiving the output signal from the linear variable differential transformer and for directing a signal to the reversible motor to drive the reversible motor in a first direction when the output signal from the linear variable differential transformer has one phase and for directing a signal to the reversible motor to drive the reversible motor in a second direction when the output signal from the linear variable differential transformer has the second phase.

3,824,892

MACHINE TOOL WITH AUTOMATIC TOOL CHANGING MEANS

Dale J. Bondie, Fowlerville; Robert S. Sutton, Franklin, and James D. Lewelling, Birmingham, all of Mich., assignors to Ex-Cell-O Corporation, Detroit, Mich.

Division of Ser. No. 166,886, July 28, 1971. This application Apr. 11, 1973, Ser. No. 350,292
Int. Cl. B23q *1/16*
U.S. Cl. 90—58 B **3 Claims**



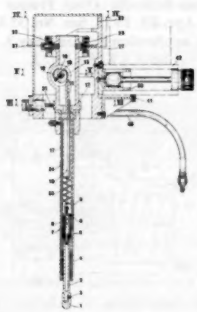
A machine tool having an automatic tool changing means and which is constructed and arranged to carry out a variety of machining operations, such as milling, drilling, boring, tapping and the like. The machine includes a rotary, four-position index work table which is carried on two movable, perpendicularly disposed slide members to provide movement of the work table along X and Z axes. A tool spindle assembly is slidably mounted on a Y axis between two column members with a tool spindle, spindle drive motor, gear box, tachometer and resolver mounted in axial alignment with each other for movement as a unit along said Y axis. A tool storage conveyor is disposed horizontally on said column members above the tool spindle assembly and for moving tools into a tool changing position above the tool spindle. A tool changer means is mounted between the column members and between the tool spindle assembly and the tool storage conveyor for automatically transferring tools directly between the tool storage conveyor and the tool spindle.

3,824,893

TRIDIMENSIONAL UNIVERSAL TRACER, SLIDABLE ON AIR BEARINGS, FOR CONTINUOUS, HIGH-SPEED COPYING OF PROFILES OF MODELS

Franco Sartorio, Moncalieri, Italy, assignor to D.E.A. Digital Electronic Automation S.p.A., Moncalieri (Turin), Italy

Filed July 6, 1972, Ser. No. 269,353
Claims priority, application Italy, July 7, 1971, 69284/71
Int. Cl. B23q *35/34*
U.S. Cl. 90—62 A **8 Claims**



A universal tridimensional tracer adapted to be connected with a measuring head of a measuring machine or a machine

tool is described. The main feature of the point of this tracer is that of having rather wide excursions which are added to the movements along the three axes x, y and z of the machine on which said tracer point is installed. Owing to the negligible inertia of this tracer point, its movement can take place at high speed, allowing drastic reduction of the copying time of the model. The axial and transverse displacements of the rod to which the tracer point is secured are independent of one another, said displacements being measured by different transducers.

3,824,894

SERVO-BOOSTERS FOR VEHICLE BRAKE SYSTEMS

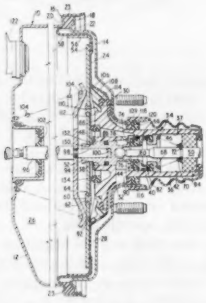
Stephen John Nicholas, Minster Close, Warwick, England

Filed Jan. 3, 1973, Ser. No. 320,759

Claims priority, application Great Britain, Jan. 7, 1972, 733/72

Int. Cl. F15b *9/10*

U.S. Cl. 91—369 B **13 Claims**



The invention concerns differential pressure operated servo boosters of the type utilizing a deflecting plate adapted to conically distort for transmitting a reaction force to the booster operator, wherein a resilient means is arranged between the deflecting plate and the booster valve to initially transfer the reaction force to the valve body rather than to the valve actuating member to increase initially the degree of opening of the valve and hence to bring about a sharp initial rise in the output characteristic of the booster.

3,824,895

FLUID RAM PROVIDED WITH MEANS FOR BRAKING THE RAM PISTON AT THE END OF ITS STROKE

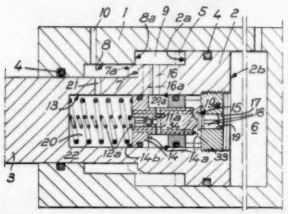
Louis Martin, Senlis, France, assignor to Societe Anonyme Poclain, Le Plessis-Belleville (Oise), France

Filed Apr. 23, 1973, Ser. No. 353,676

Claims priority, application France, May 3, 1972, 72.15721

Int. Cl. F15b *15/22*

U.S. Cl. 91—401 **5 Claims**



A fluid ram, for example a hydraulic ram, is provided with means for braking the ram piston at the end of its stroke. According to the invention the piston is braked by the action of the ram working fluid, and means are provided for preventing the pressure of the working fluid becoming excessively high. In one embodiment the entire braking means is located inside the ram in order to simplify connection to the working fluid supply circuit. The invention is applicable to both single and double action rams.

3,824,896

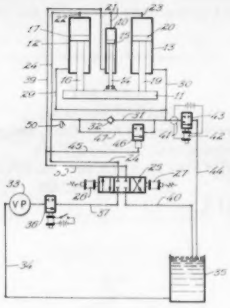
HYDRAULIC COMPRESSION CIRCUITS

Herbert G. Tull, III, Charlottesville, Va., assignor to Hoerner Waldorf Corporation, Ramsey, Minn.

Filed Nov. 24, 1971, Ser. No. 201,915

Int. Cl. F15b *11/16, 13/06*

U.S. Cl. 91—404 **1 Claim**



The cycle of operation of a compression platen or the like reciprocated by a main cylinder by adding one or more additional cylinders having piston rods engaging the platen. Fluid pressure is directed against the pistons in the main cylinder and additional cylinders in a direction to move the platen in a compression direction. The other ends of the additional cylinders are connected to the fluid pressure supply line through a check valve to circulate the fluid being forced from the additional cylinders back to the cylinders without flowing through the reservoir pump, moving the platen at relatively high speed and relatively low force. When resistance to movement of the platen exceeds a predetermined amount, the circulating line is closed and fluid from the additional cylinders is bypassed to the reservoir.

3,824,897

MULTISPEED HYDRAULIC OR PNEUMATIC DEVICE

Anders Ivar Bryntse, Mjolby, and Karl Erik Berkestad, Linkoping, both of Sweden, assignors to AB Bygg-och Transportekonomi (BI), Mjolby, Sweden

Filed Mar. 16, 1973, Ser. No. 342,217

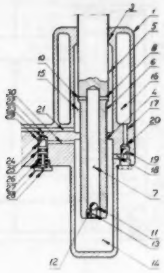
Claims priority, application Sweden, Mar. 24, 1972, 3859/72

Int. Cl. F15b *11/16*

U.S. Cl. 91—411 A **7 Claims**

A hydraulic or pneumatic device with a cylinder and piston system provides a rapid stroke and a power stroke. The piston part of the system consists of two lengthwise integrally con-

nected piston-rod like plunger pistons, with different diameters. The cylinder is also provided with two working chambers,



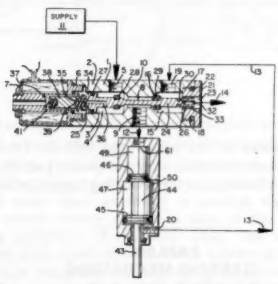
one for each piston, each working chamber at least partly surrounding its own piston. In each the pistons there is a passage connecting the two working chambers.

3,824,898

ENERGY CONSERVING DIRECTIONAL VALVE-CYLINDER COMBINATION

Richard S. Pauliukonis, 6660 Greenbriar Dr., Cleveland, Ohio 44130

Filed Apr. 12, 1972, Ser. No. 243,171
Int. Cl. F15b *15/17, 13/044*
U.S. Cl. 91—416 **6 Claims**



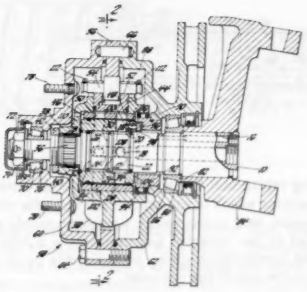
This invention relates to directional control valves designed to conserve fluid energy when serving power cylinders, and more particularly to an energy conserving TANDEM DIRECTIONAL VALVE-CYLINDER COMBINATION utilizing a solenoid valve of simple SPRINGLESS three component design to operate a specially designed power cylinder of differential diameter piston allowing the pressurized fluid to energize the piston of smaller area to do work and to return this piston to the original position by the exhaust of the same working fluid when work is completed, acting over the larger piston area in tandem action with pressurized working fluid passing through the passages of the directional control valve allowing for energy conservation with resultant savings to the user of such unit in automation, instrumentation and miniaturization fields.

3,824,899

HYDRAULIC MOTOR HAVING A HYDRAULIC LOCK CONTROL DRIVE PIN

Donald L. Dzioba, Bridgeport, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 22, 1973, Ser. No. 390,386
Int. Cl. F01b *13/06*
U.S. Cl. 91—491 **2 Claims**



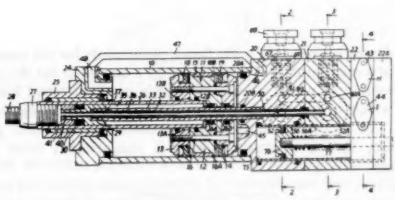
A radial piston hydraulic motor in which a valve, rotatably driven by the motor output, through a drive pin, provides timed fluid flow to and from the motor cylinders relative to rotation of the motor output. If the valve should seize in the cylinder housing, the pin will shear, opening a passage therein, to provide a fluid flow connection between the high pressure side of the motor and the motor case to prevent a hydraulic lock from forming in the cylinders.

3,824,900

MOVEMENT CONTROL APPARATUS

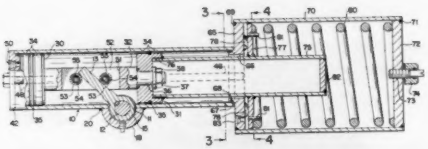
John Douglas McLelland, 36 St. George Rd., Swanley, England

Filed Nov. 3, 1972, Ser. No. 303,367
Claims priority, application Great Britain, Nov. 11, 1971, 52514/71
Int. Cl. F15b *15/22*
U.S. Cl. 92—8 **7 Claims**



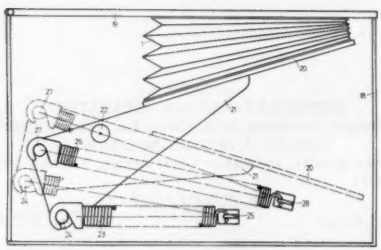
The invention provides an apparatus for a tool slide at controlled speeds comprising a double-acting fluid operated piston and cylinder for advance and return, and fluid control means for controlling the speed of advance and return, said means including concentric tubes within the cylinder communicating with advance and return control valves located one behind the end of the cylinder remote from the tool slide.

3,824,901
SPRING RETURN FOR PISTON OPERATOR
Jon L. Shafer, Mansfield, Ohio, assignor to Shafer Valve Company, Mansfield, Ohio
Filed Jan. 18, 1973, Ser. No. 324,900
Int. Cl. F01b 7/00, 31/00
U.S. Cl. 92—13.6 8 Claims



A spring return unit for actuating in one direction a linear piston operator which is actuated in the opposite direction by fluid pressure, said spring return being removably attachable to one end of the operator and comprising a fully enclosed pre-loaded compression spring compressible by an extension element on the end of the operator.

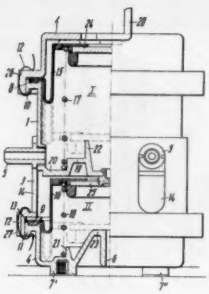
3,824,902
DEVICE FOR PRODUCING GAS FLOWS
Sven-Gunnar Sigvard Olsson, Sollentuna, Sweden, assignor to Siemens Aktiengesellschaft, Erlangen, Germany
Filed Apr. 12, 1971, Ser. No. 132,996
Claims priority, application Sweden, Apr. 13, 1970, 5025/70
Int. Cl. F16j 3/00
U.S. Cl. 92—40 1 Claim



A device for producing gas flows, particularly for the operation of a respirator, is characterized by a container for the gas the volume of which is variable within predetermined limits and which is connected with an inflow line and an outflow line. The device includes means producing a constant gas pressure in the container which is independent from its volume.

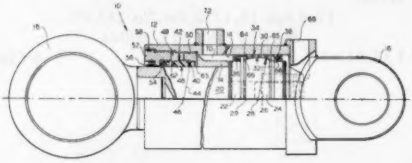
3,824,903
VACUUM CONTROL DRIVE
Johann Hahn, Stuttgart, Germany, assignor to Suddeutsche Kuhlerfabrik Julius Fr. Behr, Stuttgart, Germany
Filed Nov. 21, 1972, Ser. No. 308,462
Claims priority, application Germany, Nov. 26, 1971, 2158786
Int. Cl. F01b 19/00
U.S. Cl. 92—48 14 Claims

A two-stage vacuum control drive is disclosed in which a vacuum control drive, consisting of a roll membrane movably mounted to counteract the action of a spring under the influence of a vacuum, is mounted displaceably in the housing of



a second similar vacuum control drive. The two drives are controlled independently and have a cumulative effect on the total travel of the device.

3,824,904
LINEAR ACTUATOR
Peter J. Visser, Niles, Mich., assignor to Clark Equipment Company, Buchanan, Mich.
Filed Dec. 23, 1971, Ser. No. 211,523
Int. Cl. F16j 15/18, 9/00
U.S. Cl. 92—128 6 Claims

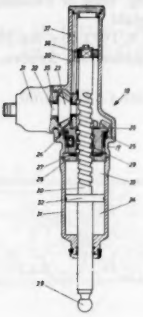


A linear actuator of the piston and cylinder type having sleeves with spherical surfaces for the piston and the rod on which the piston is mounted for providing improved resistance to lateral forces.

3,824,905
STEERING MECHANISM
Erich Jablonsky, Schwabisch Gmund, Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany
Filed Apr. 11, 1972, Ser. No. 242,920
Claims priority, application Germany, Apr. 19, 1971, 2118813
Int. Cl. F01b 9/00; F16h 29/02, 29/20
U.S. Cl. 92—136 5 Claims

A mechanism for actuating vehicle steering rods is provided having gearing intermediate the steering spindle and a nut operated rod actuator in order to increase mechanical advantage, particularly for heavy vehicles. Thus, in the event of pressure power failure used in booster steering, manual operation is readily usable without the usual extremely heavy physical force necessary with conventional mechanisms. Further, the invention used with or without power steering overcomes a drawback of prior art so-called rack steering arrangements. Thus, the gearing required for actuating steering rod mechanisms becomes increasingly larger where used for larger

vehicles due to the increased steering forces required. This results in a loss of mechanical advantage at the steering wheel



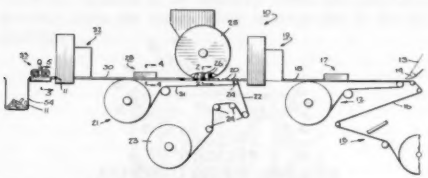
with conventional mechanisms, a condition precluded by the present invention which substitutes a rod actuator driven via bevel gears having a ratio affording a mechanical advantage.

3,824,906

HEAT SEALING APPARATUS FOR FILTER RODS

Floyd Vanhall, Durham, N.C., assignor to Liggett & Myers Incorporated, New York, N.Y.

Filed July 3, 1972, Ser. No. 268,816
Int. Cl. A24c *5/50*
U.S. Cl. 93—1 C **18 Claims**



The travelling filter plug rod is wrapped with a heat seal paper and a seam sealer secures the overlapping edges of the heat seal paper to itself to effect a seam seal. Thereafter, the wrapped filter plug rod is severed into individual filter assemblies and each filter assembly is pushed through a heat chamber which effects a heat sealing of the paper to the remaining periphery of the filter plug. The heat chamber cooperates with a pair of hold down wheels or spring biased plates which maintain the travelling filter rod within the passageway of the heat chamber. The plates also serve to control the ejection speed of the filter assemblies.

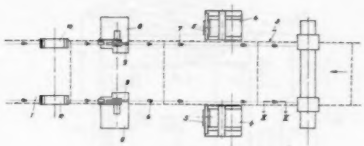
3,824,907

SYNCHRONIZED PAPER WEB TRANSPORT AND CONNECTING STRAP CUTTING AND POSITIONING APPARATUS

Karlheinz Gartner, Morsch, Germany, assignor to Automation fur grafische Technik GmbH, Dusseldorf, Germany

Filed Feb. 6, 1973, Ser. No. 330,132
Claims priority, application Germany, Feb. 8, 1972, 2205714
Int. Cl. B31b *1/10, 1/90*
U.S. Cl. 93—1 R **12 Claims**

Connecting straps or clips, cut from a ribbon of connecting material are positioned at the edge of perforated paper webs, through the perforations, to retain superimposed webs in aligned position, so that the webs, when passed through a folding machine, will retain their respective alignment. To provide for accurate simultaneous cutting of the clips from the ribbon, during transport of the web, a continuously driven feed roller transports the ribbon to a gap between opened upper and lower knives which, when the clip is to be cut, move towards each other. The knives themselves are retained in a frame which is movable in the direction of the path of the transport of the web, and reciprocates in synchronism with the cutting



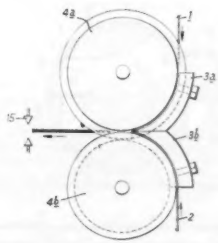
operation and speed of the transport of the web, movement being counter the direction of feed of the ribbon after the cutting operation has severed a connecting clip from the ribbon to permit continuous feed of the ribbon through the then opening gap between the knives and projection of the ribbon through the gap between the knives to form the next succeeding connecting clip. The mechanism is cam-controlled with a single cam controlling both reciprocating and cutting operation to maintain accurate synchronism.

3,824,908

APPARATUS FOR PRODUCING PACKAGING ARTICLES

Frank John Rowell, 7 Manwood Ave., Canterbury, England

Filed Nov. 1, 1972, Ser. No. 302,856
Int. Cl. B31b *19/60, 1/64*
U.S. Cl. 93—8 VB **1 Claim**



The invention provides a method of producing material for use in packaging, and apparatus for carrying out that method, which includes the steps of providing first and second continuous webs of sheet material each having longitudinally on a face thereof a respective one of a pair of elongated male and female closure formations, moving said first and second webs along closing paths with the respective formations presented towards each other, applying pressure to the male and female formations across the plane of separation of the webs so as to cause them to become interengaged and thereby define one of a first pair of opposed boundaries of the receptacle, said webs being initially, simultaneously, or subsequently joined longitudinally at a position spaced from said formations so as to define the other of said first pair of opposed boundaries.

3,824,909

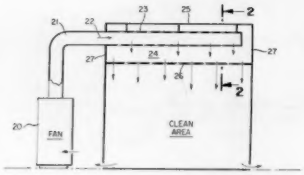
DISTRIBUTION SYSTEM FOR CLEAN ROOMS

James P. Horneff, Cherry Hill, N.J., and Michael H. Pelosi, Jr., Broomall, Pa., assignors to CGT Corp., West Conshohocken, Pa.

Continuation-in-part of Ser. No. 26,584, April 8, 1970, abandoned. This application Nov. 24, 1972, Ser. No. 309,267

Int. Cl. F24f *13/08*

U.S. Cl. 98—40 C 14 Claims



A system for providing a uniform mass air displacement, commonly called laminar flow, at high flow rates to occupied rooms is disclosed comprising a rigid plenum chamber located at the top of a room, having a rigid perforated bottom enclosing side of the plenum forming the ceiling of the rooms, and a plurality of distribution ducts into which air is introduced from an external fan and which provide a first stage of conversion from velocity pressure to static pressure. The distribution ducts may be singular ducts or a combination of one duct within another, the ducts being perforated in varying degrees.

3,824,910

AIR FLOW CONTROLLING DEVICE FOR MOTOR VEHICLES

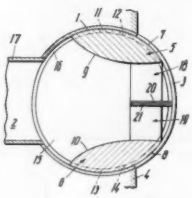
Josef Temming, Amselweg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed May 22, 1973, Ser. No. 362,652

Claims priority, application Germany, June 21, 1972, 2230239

Int. Cl. F24f *13/06*

U.S. Cl. 98—40 A 13 Claims



An air flow controlling nozzle having a cylindrical housing with an air input and an air output opening lying substantially diametrically opposite to each other, a pair of flow guides arranged in the housing slideably over an inner surface of the housing, each of the guides has an inner surface on a side thereof facing the inner space of the housing and an outer surface having a curvature corresponding to a curvature of the housing thereby to facilitate sliding of the guide over the inner wall of the housing, the flow guides are arranged with respect to each other and their inner surface is shaped so that the smallest distance between their inner surface remains constant at any position of the guides relative to each other, whereby the air flow through the nozzle apparatus remains constant at any relative position of the guides but the exit speed of the air can be varied by the relative positioning of the guides with respect to each other and the direction of the air flow can be also varied by the adjacent positioning of the guides at various angular positions in the housing.

3,824,911

VENTILATION OF A TUNNEL, MINE ADIT OR THE LIKE

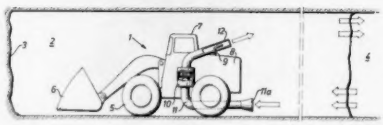
Ingvar Janelid, Forsetevagen 18, Djursholm, and Sven Gunnar Bergdahl, Jakobsberg, both of Sweden, assignors to Said Janelid, by said Bergdahl

Filed Dec. 8, 1972, Ser. No. 313,520

Claims priority, application Sweden, Dec. 16, 1971, 16176/71

Int. Cl. E21f *1/00*

U.S. Cl. 98—50 17 Claims



The supply of fresh ventilation air to a tunnel is improved by blowing, by means of a fan or air mover, air along one wall of the tunnel, or along the ceiling of the tunnel, and by moving said fan or air mover forward and backward in the tunnel. The air in the tunnel is stratified, and therefore the ventilation is effective also in tunnels of a considerable length.

3,824,912

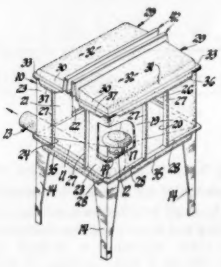
POWDER SPRAY BOOTH

Frederick K. Jensen, Farmington, and Gordon W. Jewell, Genoa, both of Mich., assignors to Elektro-Ion, Inc., Farmington, Mich.

Filed Dec. 29, 1972, Ser. No. 319,474

Int. Cl. B05c *11/16, 5/00*

U.S. Cl. 98—115 SB 11 Claims



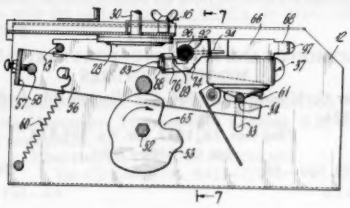
A powder spray booth for use with an electrostatic powder spray gun for coating objects in an electrostatic field as said objects are passed through the booth. The booth includes a bottom panel on which is fixedly mounted a front panel, a rear panel and a pair of side panels. A top panel is operatively mounted on top of the last-named panels. All of the aforementioned panels are made from molded fireproof fiber glass material. Each of the side panels is integrally connected to the adjacent front and rear panels by rounded corner portions. The top and bottom panels are each provided with rounded corners. Each of the side walls is provided with an opening for the passage therethrough of a workpiece to be sprayed with powder. The front panel has an opening for admitting a powder spray gun for spraying the workpiece. At least one powder outlet opening is provided in one of the panels. The top panel has a longitudinal opening for the passage therethrough of a supporting means for the workpiece, and a metallic powder collecting means, at ground electrical potential, is disposed around each side of said longitudinal opening in the top panel.

3,824,913

APPARATUS FOR CLEANING BREW HEAD SCREEN

David Herman, Livingston, N.J., and Sidney J. Friedman, New York, N.Y., assignors to Coffee-Mat Corporation, Kenilworth, N.J.

Filed Apr. 16, 1973, Ser. No. 351,238
Int. Cl. A47j 31/00
U.S. Cl. 99—298 13 Claims



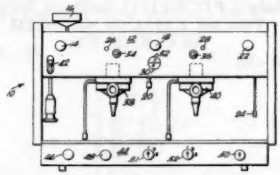
A single-cup coffee brewing assembly includes a brew cup which is moved from an inverted depressed position to a raised upright position, and is connected to a metered source of hot water. A cover member advances longitudinally into registry with the brew cup which engages the advanced cover upon the brew cup reaching its raised position. The cover has a bottom metal screen which is cleaned with the cover advancing and retracting movement by passing over a transversely extending helically wound brush. The brush is upwardly spring-biased and is replaceable in a support bracket which is releasably mounted in the assembly frame. The cover has a chamber above the screen which is connected to the brew discharge.

3,824,914

EXPRESSO COFFEE MACHINE

Sergio M. Casiano, 416 S.W. 8th St., Miami, Fla. 33130

Filed May 16, 1973, Ser. No. 360,797
Int. Cl. A47j 31/34
U.S. Cl. 99—302 R 7 Claims



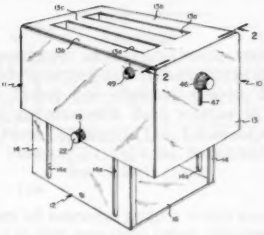
An expresso coffee machine which utilizes a water proportioning device referred to as a "Doser" which is electrically actuated to consistently, automatically measure the exact amount of water required for each coffee brewing demand. The water doser operates in conjunction with a high pressure water pump for forced percolation. A selector switch is provided on the front of the coffee maker which enables the operator to select the exact desired volumn of water.

3,824,915

DROP-OUT TOASTER

Eugene G. Capucio, P.O. Box 1087, Caracas, Venezuela

Filed Aug. 18, 1972, Ser. No. 281,924
Int. Cl. A47j 37/08
U.S. Cl. 99—329 RT 3 Claims



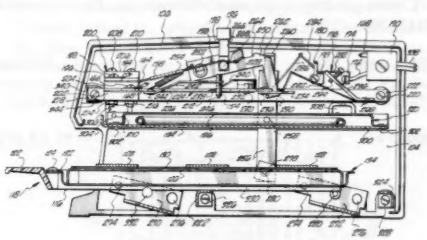
There is disclosed a toaster of unique design having an upper toaster section and a lower toast receiving section telescopically receivable within the toaster section, the toaster section having means for retaining toast and for releasing toast to drop out into the toast receiving section.

3,824,916

BACON COOKER

B. Sherman Green, Pacific Palisades; Charles K. Green, Malibu, both of Calif.; Jack L. Glancy; Floyd J. Myrick, both of Jackson, Miss.; Carl William Norlander, Canton, Miss., and Rodney E. Smith, Philadelphia, Miss., assignors to Udico Electric Company, Canton, Miss.

Filed Dec. 30, 1971, Ser. No. 214,046
Int. Cl. A47j 27/62, 37/04
U.S. Cl. 99—334 9 Claims



Cooking apparatus, designed particularly for the cooking of bacon and the like, with an electrical resistance heating element. The electrical resistance heating element and associated cooking surface are contained within the apparatus so as to float vertically, resting upon the material being cooked. A cooking tray, upon which the material to be cooked is placed, and which has surface so as to permit the passage of grease there through, is supported beneath the cooking surface. The period of cooking is controlled automatically as a function of temperature and manually to select degree of doneness. Cooking is initiated and terminated by relative movement between the tray and the cooking surface.

3,824,917

STERILIZATION AND/OR COOKING APPARATUS

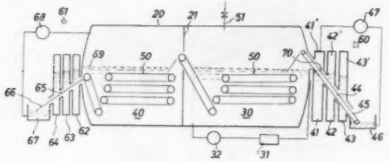
Takeji Kawahara, Osaka, and Masahiro Terumoto, Tokyo, both of Japan, assignors to Itami Keiran Kako Kabushiki Kaisha, Osaka, Japan

Filed Nov. 7, 1972, Ser. No. 304,310

Claims priority, application Japan, Nov. 26, 1971, 46-94464; Jan. 17, 1972, 47-07099

Int. Cl. A23l *3/04*

U.S. Cl. 99—404 9 Claims



A sterilization and/or cooking apparatus for the heat treatment of hermetically sealed containers such as cans, bottles, jars and the like, comprising a main chamber containing therein a high-temperature sterilizing and/or cooking medium under high pressure, an intermediate chamber containing therein a sealing liquid and communicated with said main chamber, and at least one auxiliary chamber containing therein a sealing liquid and communicated with the intermediate chamber in series at a level below the level occupied by the liquid in the auxiliary chamber. This chamber system may result in that the hydrostatic pressure applied or loaded on the outermost or final stage auxiliary chamber is reduced remarkably with respect to the pressure in the main chamber so that the leakage liquid from this auxiliary chamber can be suppressed in volume. The containers to be subjected to the heat treatment are introduced into the main chamber and withdrawn therefrom through the auxiliary chambers and intermediate chamber which are communicated in series to the main chamber through said communication system.

3,824,918

PROCESSING A CURD-WHEY MIXTURE

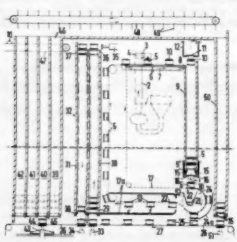
Armand Francois Bronkhorst, Doorn, Netherlands, assignor to Holvrieka International B.V., Utrecht, Netherlands

Filed Dec. 20, 1972, Ser. No. 317,089

Claims priority, application Netherlands, Dec. 21, 1971, 7117579

Int. Cl. A23c *19/02*

U.S. Cl. 99—452 7 Claims



A method of processing a curd-whey mixture in a cycle process into cheese, as well as an apparatus for applying this method. In this apparatus single or assemblies of vertical tubes are applied for the different processing phases. In the first tube the curd coming from a prior art apparatus for separating curd mass from whey is lowered in cheese moulds, as a result of which the cheese is pressed by the stacking in the tube. Via a conveyor with emptying mechanism the cheeses are lowered in containers and the empty moulds are again passed to the whey-curd separator. The containers, having a sieve for discharging excess whey, on which the cheeses come to rest are lifted in a second tube at a speed sufficient to reduce the bacterial activity. Then the cheeses move to a curing and brining section comprising a plurality of vertical tubes in order to be brined. The cheeses remain in said section for so long a time as is necessary for sufficient curing. After removal of the ready cheeses the containers are introduced in another vertical tube functioning as a container storage tube. Containers withdrawn from the lower end come again in the place where the cheeses are lowered from the moulds into the containers.

3,824,919

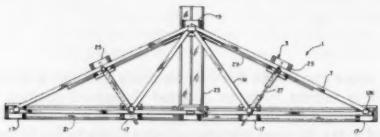
METHOD OF AND APPARATUS FOR FABRICATING WOOD STRUCTURES

Walter G. Moehlenpah, 9906 Old Warson Rd., Ladue, Mo. 63124

Filed Nov. 10, 1972, Ser. No. 305,518

Int. Cl. B30b *13/00*

U.S. Cl. 100—35 29 Claims



A method and apparatus for fabricating wood structures utilizing a C-shaped press having an upper platen and a lower platen which are relatively movable toward and away from one another for driving nailing plates into two or more wood members from above and below, in which the wood members are held in position for being nailed together on a plurality of stands arranged on lines bounding the structure. Each such stand includes means for supporting the wood members and has a holder plate adapted to hold a nailing plate for being driven upwardly into the wood member from below by the lower platen of the press. The supporting means and the holder plate are so mounted on the stands as to enable lateral entry of the lower platen of the press from either side of the stand to an operating position below the holder plate. The press is mounted for generally lateral movement with respect to the press substantially sidewise into and away from an operating position at each such stand. Means are provided for preventing operation of the press unless it is in an operating position at a stand.

3,824,920

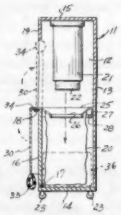
COMPACTOR CABINET SHIELD

Floyd R. Gladwin, P.O. Box 1113, Southgate, Mich. 48192

Filed Jan. 2, 1973, Ser. No. 320,238

Int. Cl. B30b *15/30*

U.S. Cl. 100—53 4 Claims



A box-like trash compactor cabinet for containing a trash bag in its lower portion and a compressor ram in its upper por-

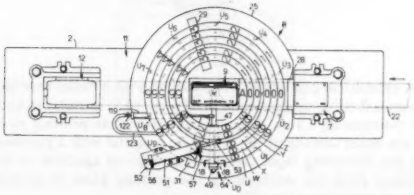
tion for compressing trash in the bag. A door covers the lower half of the front of the cabinet, with the upper half of the front of the cabinet, above the door, being open for receiving trash. A horizontal tray-like hopper is arranged above and opens into the bag and is removably supported between the walls of the cabinet just above the upper edge of said door. A rigid closure plate, overlapping the door, has an upper edge portion hingedly connected to the front edge of the hopper and a lower edge provided with a thick, wide, resilient, edge band, with the plate being swingable upwardly to completely close the opening above the door and frictionally locking in said closed position by the compressive frictional engagement of the band with the cabinet portion defining the upper edge of the opening.

3,824,921

SERIAL NUMBER EMBOSSING APPARATUS

Donald Ray Alexander, Treasure Hills Addition, R.R. 3, Box 291, Conway, Ark.

Filed Oct. 11, 1972, Ser. No. 296,602
Int. Cl. B44b *5/00*; **B41l** *47/50*
U.S. Cl. 101—19 **8 Claims**



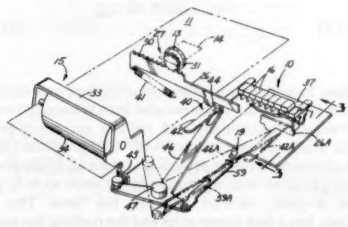
A power press is equipped with a progressive die for continuously working strip stock into perforated plates having embossed inscriptions and serial numbers, such as automobile license plates. The die includes a flat concentric assembly of relatively rotatable rings each of which has a circular series of consecutive digit embossing elements at the obverse side of the assembly. At the converse side of the ring assembly a back and forth swingable indexing arm cooperates with notches in the rings so as to rotate the rings stepwise in predetermined order and present the digit embossing elements thereof in successive serial number configurations.

3,824,922

VARIABLE INPUT DATA RECORDER

John J. Van Acker, Chesterland, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Continuation of Ser. No. 191,674, Oct. 22, 1971, abandoned. This application July 9, 1973, Ser. No. 377,348
Int. Cl. B41j *7/08*
U.S. Cl. 101—45 **3 Claims**



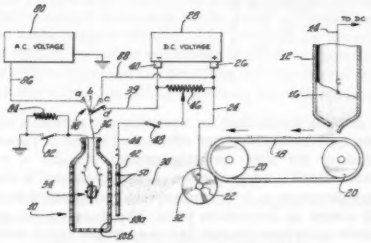
A variable input data recorder is disclosed comprising a data input means and a data recorder means. The data input means can be programmed by actuating keys or levers while the data input means is located within or at a remote location from the data recorder means. When the data input means is inserted into the data recorder means, the action of a printing head effects movement of printing characters in accordance with the preactuated keys or levers to transfer the programmed information into the recorder to be recorded on a document. The invention is compatible for use with pushbutton keys or conventional slide levers operating at a local or remote location from the recorder.

3,824,923

ELECTROSTATIC PRINTING APPARATUS HAVING IMPROVED COUNTER-ELECTRODE

William T. Fisher, Los Alamitos; Charles B. Patterson, Lakewood, and Stanley M. Dahl, Whittier, all of Calif., assignors to Purex Corporation, Ltd., Lakewood, Calif.

Filed Aug. 11, 1970, Ser. No. 62,983
Int. Cl. B41f *15/00*
U.S. Cl. 101—114 **9 Claims**



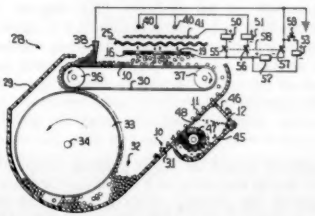
Electrostatic printing apparatus for printing on bottles in which the means forming a counter-electrode within the bottle includes means forming circular upper and lower corona discharge gaps centered on the bottle axis comprising axially spaced electrode terminals and a circular electrode coaxial with the bottle axis and between the terminals.

3,824,924

ELECTROSTATIC SCREEN PRINTING AND CLEANING

Kenneth W. Rarey, South Holland, and John B. Kennedy, Jr., Chicago, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Continuation of Ser. No. 599,822, Dec. 7, 1966, abandoned, which is a division of Ser. No. 396,060, Sept. 14, 1964, Pat. No. 3,306,193. This application Feb. 17, 1969, Ser. No. 802,747
Int. Cl. B41f *15/00*; **B05b** *5/02*
U.S. Cl. 101—114 **16 Claims**



An electrostatic screen printing device having means for depositing toner on a substrate and having means for neutralizing the electric field associated with the toner-image. Additional means are provided for cleaning toner from the screen and/or printing device subsequent to a printing operation.

3,824,925

PRINTING MECHANISM WITH OVERDRIVE FOR THE PRINTING CYLINDER AND INKING ROLLERS

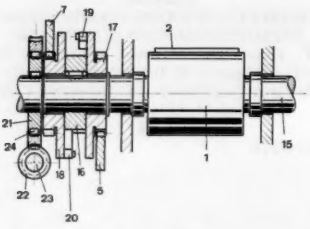
Markus Ebneter, St. Gallen, Switzerland, assignor to Firma Ferd. Ruesch Maschinenfabrik, St. Gallen, Switzerland

Filed July 14, 1972, Ser. No. 271,871

Claims priority, application Germany, Apr. 21, 1972, 2219534

Int. Cl. B41f 3/02, 5/00

U.S. Cl. 101—212 2 Claims



A printing mechanism for a printing and punching machine of the type having stepwise advance of a web of paper to be printed or for sheet printing presses includes a printing cylinder which is adapted to be constantly rotated in the same rotary direction as it is transversely reciprocated back and forth across an impression plate. The drive for the printing cylinder comprises a motor driven eccentric crank shaft drive means, and mounted on the shaft of the printing cylinder is an overdrive mechanism for rotating the printing cylinder at a reduced speed as the cylinder reaches the end positions of its reciprocating stroke in order to ensure the constant rotation of the printing cylinder and its associated inking mechanism in order to obtain the uniform transfer of ink from the inking rollers to the printing plate.

3,824,926

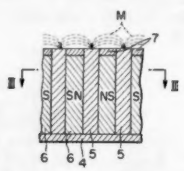
PRINTING MAGNETIC SADDLE

Yasuo Fukuyama, Osaka, Japan, assignor to Yamauchi Rubber Industry Co., Inc., Osaka, Japan

Filed Aug. 18, 1972, Ser. No. 281,642

Int. Cl. B41f 27/02

U.S. Cl. 101—378 8 Claims



A magnetic saddle for use in printing comprising the base plate for saddle consisting of a non-magnetic material and superposed on the printing cylinder, a plurality of yokes arranged at regular intervals on the surface of said base plate lengthwise, and the permanent magnet consisting of a plurality of small blocks of ferromagnetic material, said blocks being arranged between said yokes and conjoined by virtue of the binder consisting of a thermosetting resin and filling the gaps, wherein the base plate, the yoke and the permanent magnet are integrated.

3,824,927

LAMINATED MAGNETIC PRINTING ROLL ASSEMBLY

K. O. Pugh, Atlanta; Howard Ivey, Austell, and C. A. Cobb, Decatur, all of Ga., assignors to Ruralist Press, Inc., Atlanta, Ga.

Filed Jan. 29, 1971, Ser. No. 110,874

Int. Cl. B41f 27/02

U.S. Cl. 101—378 14 Claims

A cylindrical printing roll is provided with a radial shoulder having a flexible magnetic material secured to its outer surface for maintaining a thin magnetically attractable printing plate on the outer surface of the magnetic material with a positioning pin extending from the shoulder into an aperture in the printing plate for maintaining the printing plate in desired aligned position on the roll.

3,824,928

FLEXIBLE PRINTING PLATE LOCKING DEVICE FOR ROTARY PRINTING PRESS

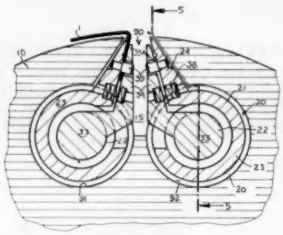
Karl Langer, Heusenstamm, Germany, assignor to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Offenbach/Main, Germany

Filed Apr. 27, 1973, Ser. No. 354,960

Claims priority, application Germany, April 27, 1972, 2220652

Int. Cl. B41f 27/12

U.S. Cl. 101—415.1 14 Claims



A plate lock-up mechanism including first and second jaw members in the form of a sleeve and shaft telescoped together, each having longitudinally and radially extending jaws and with the sleeve being provided with a longitudinal clearance slot. A clamping screw is provided at the end of the sleeve for imparting relative rocking motion to the shaft so as to grip the end of a plate inserted between the jaws. The sleeve, moreover, has a jack screw at its end for rocking the entire jaw assembly for tensioning and peripherally positioning the plate. In the preferred embodiment the sleeve has an extension in the form of a collar for mounting the clamping screw and jack screw. To adjust the axial position of the jaws and plate, the

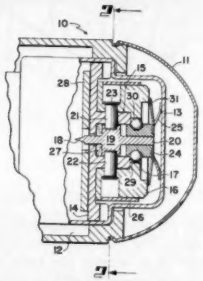
sleeve and collar are mounted for axial sliding movement in the cylinder, and an axially oriented adjusting screw is interposed between the collar and the cylinder for endwise crowding of the collar in one direction or the other. To establish a nominal position of peripheral register, the collar is provided with an eccentrically located stop screw and the cylinder is provided with a stop member in the path of rocking movement of the stop screw. The stop member is rotatable and has stop surfaces in the form of facets of different radial dimension which are selectively interposeable. Auxiliary jaw members are mounted coaxially with respect to the main jaw members and have respective axially facing keyed connections therewith which may be engaged to extend the effective width of the jaw thereby to accommodate plates of different width.

3,824,929

STORED ENERGY INITIATOR TYPE OF FUZE

George Webb, 420 S. 22nd St., Richmond, Ind. 47374

Filed Dec. 15, 1965, Ser. No. 514,148
Int. Cl. F42c *1/00*
U.S. Cl. 102—74 **5 Claims**



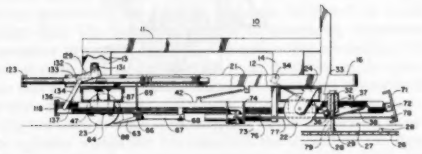
This is a nose fuze construction. A firing pin projects forwardly through an actuator in position to be directly actuated by high impact forces. The actuator is associated with a prestressed firing spring to store mechanical energy and is associated with an inertia member which senses soft or indirect impact and shifts position, releasing the actuator and firing spring, so that the firing pin is driven to perform the firing operation. Both the firing pin and the inertia member are locked in position by centrifugal-force-responsive weights which move radially outwardly to unlock the firing pin and inertia member. A second spring causes the forward nose portion of the firing pin to assume an exposed position when these weights are in their unlocking position.

3,824,930

TOW LINE TRUCK AND BRAKE SYSTEM

Richard M. Biessener, Faribault, Minn., assignor to Nutting Truck and Caster Company, Faribault, Minn.

Filed July 13, 1973, Ser. No. 378,910
Int. Cl. B65g *17/42*
U.S. Cl. 104—172 BT **10 Claims**



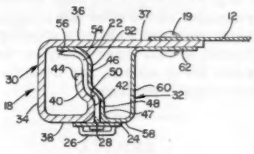
An improved truck for tow line use is provided with a brake system designed to stop the truck in response to engagement of a front bumper against an obstacle, while minimizing the force applied by the truck and bumper to the obstacle. The truck includes a brake member having a bottom floor-engageable surface and an upper wheel-engageable surface. A longitudinally movable brake support member on the truck supports the brake member in front of at least one wheel for relative movement between a retracted position ahead of the wheel and a braking position in which the brake member is engaged beneath the wheel. The brake support member is mounted on the truck by low-friction ball or roller bearings, to further insure operation of the brake system with minimal application of force against an obstacle. The front bumper is movably mounted on the brake support member for movement from a rest position to an active control position by engagement with the obstacle. Movement of the front bumper to active position controls an anti-back-up device, in the form of a one-way clutch and brake interconnecting the truck body and brake support member, which permits forward movement of the truck body and wheel onto the brake member with a resulting cessation of forward motion due to the action of the brake member and weight of the truck, rather than the resistance of the obstacle. The anti-back-up device also prevents premature rearward movement of the wheel and truck body from the brake support member. The anti-back-up device is released forcibly by return movement of the front bumper to its rest position. Improved tow pin lifting and rear bumper features are also shown, including a specially latched, resiliently held bumper.

3,824,931

NAILABLE DOOR POST

John W. Hutchinson, Crown Point, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed Feb. 5, 1973, Ser. No. 329,801
Int. Cl. B60p *7/08*; **B61d** *45/00*
U.S. Cl. 105—369 B **4 Claims**



In a freight car, a vertically extending nailable metal door post including a first outer doorway member of generally C-shaped configuration and a second longitudinally spaced inner reinforcement member; said first member having flat outer transversely extending doorway wall, a pair of inner and outer laterally spaced longitudinal sections connecting with the doorway wall, and a nail groove forming transverse flange section spaced longitudinally inwardly of the doorway and laterally outward of the inner longitudinal section and having a convex bulbous portion extending from the inner longitudinal section towards the outer longitudinal section and a transverse flat end portion connected outwardly to the bulbous portion, said outer longitudinal section having a longitudinally extending elongated attachment portion connecting with the vehicle side wall; said second member being spaced longitudinally inward of the outer doorway member and being of generally U-shaped configuration and having a transverse flange including a first flange section having vertically spaced alternating recessed and protruding flange portions to define the bulbous portion the entranceway of a nail groove, a second intermediate transverse portion to define with the transverse end portion of the doorway member the rest of the groove, and a third nail bending and curved post-reinforcing portion connecting with the intermediate transverse portion and having a flat longitudinal end part against the inside of the

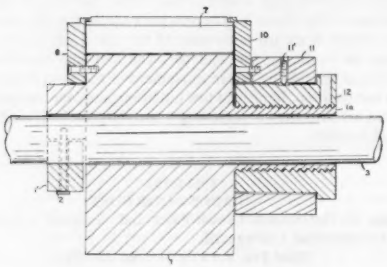
longitudinal section of the doorway member, said second member further having an inner longitudinal wall connecting with the transverse flange, an inner transverse wall extending toward the side wall of the car and connecting with the inner longitudinal wall of the second member, and an inner longitudinal side wall attachment flange portion connecting with the inner transverse wall of the second member and with the attachment portion of the doorway member connecting with the side wall of the freight car. A modified nailable door post uses welded-inlplace elements between the two pieces of the post to define nail receiving grooves.

3,824,932

TYPE SLUGS CLAMP IN A PRINTING PLATE CYLINDER

Theodore F. Aronson, Fort Lauderdale, Fla., assignor to Ira B. Kristel, Hewlett Harbor, N.Y.

Filed Sept. 22, 1972, Ser. No. 291,399
Int. Cl. B41f *27/06*
U.S. Cl. 101—377 **1 Claim**



In a printing cylinder having a slot adapted to receive type slugs, first clamp means are fixedly mounted on one side of said cylinder to grip one end of the slugs. Second clamp means are rotatably mounted on the other side of said cylinder with a screw type connection and includes a gripping cam jaw. The cam jaw is formed to bear downwardly on the other end of said slugs as said jaw is rotated, and inwardly as the second clamp means is rotatably tightened.

ERRATA

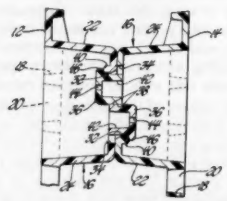
For Classes 102—74, 104—172 and 105—369 see: Patents Nos. 3,824,929 thru ,3,824,931

3,824,933

LOAD BEARING PALLET AND INTERLOCK

Willard E. Lind, Rochester, Mich., assignor to Jaw-Bar Plastics Corporation, Birmingham, Mich.

Filed Sept. 14, 1972, Ser. No. 288,913
Int. Cl. B65d *19/18*
U.S. Cl. 108—51 **4 Claims**



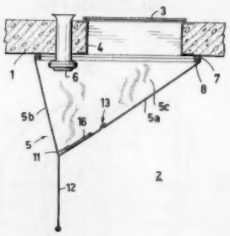
A load bearing pallet including two identical mold formed halves each having a load bearing surface and a plurality of relatively spaced supporting pads with an interlocking feature provided thereon and comprising a projection on the supporting pad extending thereacross and with an overhanging lip formed on one side thereof immediately over a draft opening, and with an opening immediately behind the projection formed for interference snap-lock and press fitted engagement therethrough of a like projection on a pallet half disposed in complimentary relation thereover.

3,824,934

LOCK CHAMBER FOR PROTECTIVE ENCLOSURES

Launo Laakkonen, Helsinki, Finland, assignor to Temet Oy, Helsinki, Finland

Filed Dec. 11, 1972, Ser. No. 314,238
Claims priority, application Finland, Dec. 13, 1971, 3545/71
Int. Cl. E05g *1/00*; **E06b** *5/18*
U.S. Cl. 109—1 R **7 Claims**



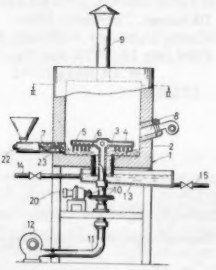
A lock chamber for protective enclosures closable by means of a protecting door. The lock chamber is formed by a collapsible shelter made of a flexible gas tight material. The lock chamber is at one side provided with an entrance opening corresponding in size to the opening of said protecting doors and at the opposite side with a vertical closable slit opening. The shelter is intended to be gas tightly fixed around the frame of said protecting door.

3,824,935

DRYING AND INCINERATING FURNACES

Yukio Yamato; Koki Terada, and Bungo Nakamura, all of Tokyo, Japan, assignors to Yamato Sanko Mfg. Co., Ltd., Tokyo, Japan

Filed May 10, 1973, Ser. No. 359,000
Claims priority, application Japan, May 10, 1972, 47-46114
Int. Cl. F23g *5/00*
U.S. Cl. 110—13 **11 Claims**



A drying and incinerating furnace containing means for effecting desiccation and incineration, in a single process, of a muddy material such as an activated sludge wherein said method is treated from the inlet side or the peripheral portion

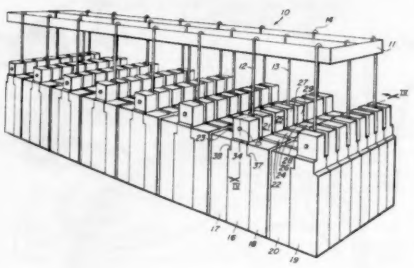
on the hearth to the outlet side or the central part of the hearth. Air-blowing nozzles and raking paddles are provided on rotary pipes for vortically blowing and transporting the material in the furnace.

3,824,936

BASIC SUSPENDED ROOF CONSTRUCTION FOR INDUSTRIAL FURNACES

Frank P. Merkle, Jr., R.R. 2 Farmington, Long Grove, Ill. 60047

Filed Feb. 28, 1973, Ser. No. 336,630
Int. Cl. F23m *5/02*
U.S. Cl. 110—99 R **4 Claims**



A high-temperature industrial furnace roof construction comprises a plurality of basic refractory brick assembly units depending downwardly from an elongated rod member which is suspended from a suitable frame. Each basic refractory brick assembly unit comprises a basic carrier brick of a generally rectangular configuration with flat, planar faces and having a reduced head portion and body portion. The reduced head portion is provided with a transverse aperture for receiving the elongated rod member and with a substantially planar recess normal to the axis of the aperture, and the body portion is provided with a shoulder means adjacent to the juncture of the body portion and the head portion on opposing faces of the body portion substantially parallel to the axis of the aperture. A basic filler brick of a generally rectangular configuration with flat, planar faces is suspended from the carrier brick by means of a supporting lug on one face of the filler brick which engages the shoulder means on the carrier brick.

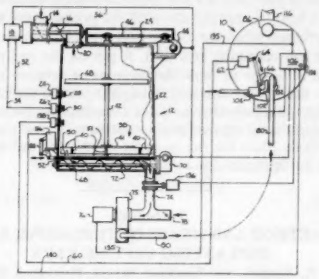
3,824,937

ENERGY GENERATION SYSTEM ADAPTABLE FOR BURNING DUST-TYPE FUELS

Leslie C. Turner, and Harry Cockreham, both of Lake Oswego, Oreg., assignors to Tureo Engineering, Inc., Lake Oswego, Oreg.

Filed May 4, 1973, Ser. No. 357,503
Int. Cl. F23k *3/00*
U.S. Cl. 110—102 **21 Claims**

An energy generation system, especially applicable to firetube boilers but also applicable to other combustion-type energy generators, for burning dust-type fuels such as wood sander-dust. The system comprises fuel metering apparatus, responsive to system demands, for accurately controlling the fuel-air ratio and modulating the mass flow rate of the dust-type fuel into the combustion chamber. Dust fuel, normally of variable density, is fed from a large storage hopper into a metering bin sized to hold only a small volumn of the fuel. A rotary agitator within the bin equalizes the density of the dust fuel and divides it into equal volumetric portions which are passed in succession over an opening in the bottom of the bin. The size of the opening is variably modulated by a reciprocating metering gate whose position is determined by a controller responsive to system energy demands. Small predetermined quantities of the fuel, dependent upon the size of the opening, drop through the opening periodically and are transformed into a continuous homogeneous stream of dust fuel by a screw conveyor located below the opening. The conveyor feeds the stream of dust into a blower which transports the dust suspended in an air stream to a dust fuel burner. In the em-



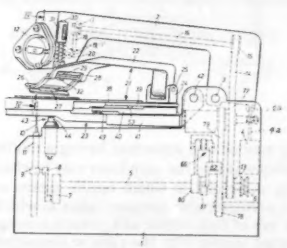
bodiment of the invention adaptable to firetube boilers, the burner comprises a modified boiler diffuser having one or more dust inlet tubes and a continuous supporting pilot to insure continuity of burning. The boiler embodiment also includes a boiler extension section having a trap for retaining any large particles of the fuel within the boiler to insure their complete combustion.

3,824,938

SEWING MACHINE CONSTRUCTION

Gunter Tolle, Wendelinusstr. 15, Bruchsal, Germany

Filed July 19, 1973, Ser. No. 380,837
Claims priority, application Germany, Jan. 16, 1973, 2301936
Int. Cl. D05b *3/04*
U.S. Cl. 112—70 **11 Claims**



A sewing machine comprises a fixed base containing a main drive shaft connected to a needle bar to reciprocate the needle bar substantially vertically in the base. A looper mounting arm is pivoted at one end of the base and includes an opposite end with a revolving looper thereon which overlies a clamping assembly for engaging the material between the looper and the needle bar. The clamping assembly includes a lower part which is pivoted at its inner end adjacent the pivotal end of the looper arm to the base of the machine and rests at its opposite end on an upwardly extending support pin which is biased upwardly by a supporting spring. The clamp includes a top arm portion which is pivoted about a substantially horizontal pivot at its inner end on a bracket carried on the lower part of the clamping mechanism and its outer end extends below the looper arm adjacent the looper. The looper is revolved by a connection extending through the looper arm and through belting to the main drive shaft of the base. The looper arm is pivoted by an electromagnetic mechanism between a raised

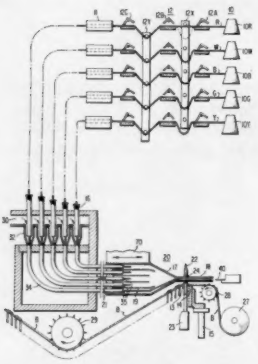
position in which it may be at rest and a lowered position in which it bears downwardly against the upper arm of the clamping part to urge a clamping frame thereon into engagement with the material which rests on a cover plate of the lower clamping part. In the sewing position, a roller of the looper arm engages against the pressure rail of the upper clamping part to urge the clamping frame over the material. The roller is carried on a bar which is biased downwardly in a direction toward engagement with the pressure rail and it may be compressed when the looper arm moves downwardly to engage the top clamping arm part. A pin on the rod member is confined in a slot to limit the amount of relative movement between the looper arm and the upper part of the clamp. The lower clamping part also includes a mechanism for controlling a sewing material support plate relative to a base plate and an intermediate plate for the purpose of shifting the material to be sewn during special sewing operations.

3,824,939

METHOD AND MEANS OF THREADING AND IMPLANTING TUFTING YARN

Abram N. Spanel, 344 Stockton Street, Princeton 08540, and David R. Jacobs, 23 Parkside Drive, East Hanover 07936, both of N.J., assignors to said Spanel, by said Jacobs

Filed Mar. 31, 1972, Ser. No. 240,119
Int. Cl. D05c *15/20*
U.S. Cl. 112—79 FF **18 Claims**



A tufting method and apparatus having a multicolor selection capability whereby the yarn color may be changed during each tufting cycle and in which needle means are supplied with yarn by reciprocable threader tubes in which each tube threads the eye of each needle and retracts leaving a length of yarn deposited therein. For the yarn so deposited, one of its ends is implanted in the backing from the preceding tufting cycle with the other end extending to the yarn source from which it has been transported to the threader tube. From this position the yarn loop extending through the needle may be either cut to produce cut pile or to enable a change in color to be made; or the yarn loop may be tufted to produce a loop pile product.

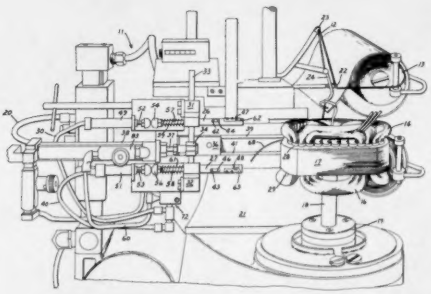
3,824,940

APPARATUS AND METHOD FOR USE IN COIL TYING

Richard J. Habegger, Grabill, Ind., and Frank R. Dombrowski, Kingston, Ill., assignors to General Electric Company, Fort Wayne, Ind.

Filed Aug. 7, 1973, Ser. No. 386,371
Int. Cl. D05b *23/00*
U.S. Cl. 112—121.2 **10 Claims**

Apparatus and methods involving lacing or tying cord about end turn portions of coils that project beyond faces of dynamoelectric machine magnetic cores. Method involves pulling and holding final cord segments; and subsequently releasing such segments. In apparatus, stator core having coils therein is placed at tying station and supported while the core and tying units are periodically relatively indexed. Loops of cord are placed about winding portions, for example in the formation of stitches. As the last loop (e.g., stitch) in a tying cycle is commenced, cord pulling member and core are moved relative to each other so that the cord pulling member is located to receive a final cord segment. Alternatively, cord pulling member moves after full development of final cord segment. A portion of final cord segment is grasped in a cord receiving region of cord pulling member. Cord clamping



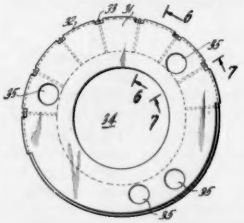
member engages and tightly holds the cord; cord pulling member retracts; and final cord segment is pulled taut and severed. The leading or advancing end of the cord pulling member may be of a blunt or pointed configuration. When a core is to be laced or tied, an end of cord is held in the cord puller and at least part of one or more loops (e.g., stitches) are made on the wound stator assembly. At a predetermined time or after a predetermined number of stitches (or portions thereof) have been made, the end of cord is released. Such release is effected before excessive tension is applied to the core so as to reduce, if not eliminate, cord fraying and cord debris build-up in and around the cord puller. This also prevents malfunctions that might occur as a result of excessive tension on a cord end during indexing of a core being laced.

3,824,941

APPARATUS FOR FORMING TREADED CLOSURES

Charles N. Hannon, 27 Sargent Rd., Scarsdale, N.Y. 10583

Continuation-in-part of Ser. Nos. 117,512, Feb. 22, 1971, abandoned, and Ser. No. 233,599, March 10, 1972, abandoned. This application Aug. 23, 1972, Ser. No. 283,098
Int. Cl. B21d *51/50*
U.S. Cl. 113—1 D **11 Claims**



Ductile metal blanks closed at one end and having cylindrical skirts are rotated in contact with forming tools under sufficient pressure to shape, lance and score the cylindrical skirt.

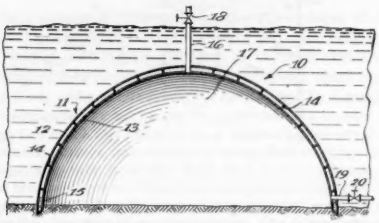
The tools may be spread along a path to deform different parts of the skirt at different path locations. The tools form an outwardly extending circumferential bulge in each skirt and simultaneously score a series of slots around the skirt in the bulge and score the external surface of the skirt between the lanced portions and the open end of the skirt. The scores are aligned in specific angular orientation relative to the orientations of the lanced slots.

3,824,942

OFFSHORE UNDERWATER STORAGE TANK

Donald Claude Stafford, Hinsdale; Gerald Edward Burns, Villa Park, and Kerry Charles McKenna, Oak Brook, all of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Jan. 17, 1972, Ser. No. 218,357
Int. Cl. B63b *35/44*
U.S. Cl. 114—0.5 T **1 Claim**



An offshore storage tank, to be placed on a sea floor, having a dome-shaped rigid continuous enclosure, open at the bottom, a buoyant chamber in the enclosure extending over a large part of the area of the enclosure and positioned and sized to provide buoyancy balance or equilibrium to the tank when the tank is floating on water with or without any amount of air in the large volume defined by the enclosure, a conduit to remove air from beneath the enclosure to lower it in water.

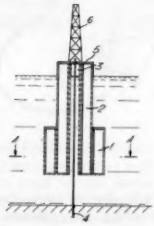
The enclosure can constitute two spaced apart rigid domed shells with rigid connecting members joined to each shell to hold them in fixed position relative to each other, with a concrete ring closing the bottom of the enclosure between the shell ends thus defining a hollow enclosed space between the shells.

3,824,943

DRILLING PLATFORM

Olav Mo, Gronsundveien 94, Nesbru, Norway

Filed Mar. 13, 1972, Ser. No. 233,879
Claims priority, application Norway, Mar. 16, 1971, 1008/71
Int. Cl. B63b *35/44*; **B63g** *35/00*
U.S. Cl. 114—.5 D **7 Claims**



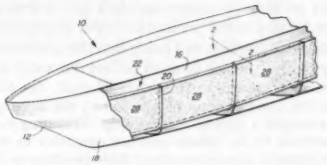
A floating platform for drilling after natural deposits beneath the floor of the sea. The platform has a reduced cross section at the sea surface, a service deck above the sea surface, and a substructure extending downwardly below the sea surface. The platform is monolithic and comprises a plurality of vertical cells of concrete. A bottom deck closes the bottom of the vertical cells and is adapted to be positioned deep below the sea surface and above the floor of the sea. The vertical cells are arranged such that at least one but not all of the cells extend from the bottom deck to the top deck and the center of gravity of the platform is below its center of buoyancy.

3,824,944

REINFORCED STRUCTURAL MEDIUM

Alfred A. H. Keil, Belmont, Mass., and Michael F. Vetter, Alexandria, Va., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Nov. 4, 1971, Ser. No. 195,548
Int. Cl. B63b *43/10*
U.S. Cl. 114—69 **10 Claims**



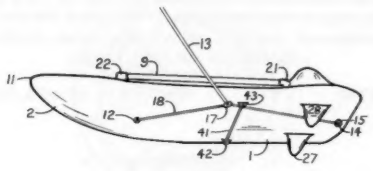
A structural medium, useful, e.g., for constructing ships, such as icebreaker-tankers, for cold climates, having a cross-section parallel to an expected direction of impact comprising a layer of ice confined between spaced-apart, ice-impermeable structural members (such as an inner cargo-containing hull and an outer hull shell).

3,824,945

STEERABLE AQUA-SLED

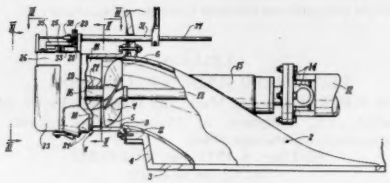
Frederick M. Casciano, 811 Olomehani St., Honolulu, Hawaii 96813

Filed Mar. 24, 1972, Ser. No. 237,788
Int. Cl. A63c *5/00*
U.S. Cl. 114—235 WS **14 Claims**



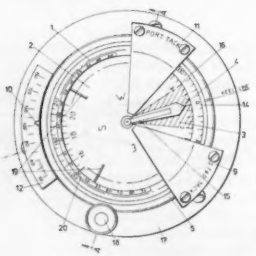
A water sled which when towed behind a moving boat is steerable from side to side by a rider in a simple but effective manner. This positive maneuverability is accomplished by moving the effective point of attachment of the towline to the sled from a point on the bow to a point on the side of the sled causing the sled to become aligned at some appreciable angle to the towline direction. The relative water flow striking the sled at an angle and the two bottom skegs cause the sled to dart to the outside of the towboat wake. The rider changes the effective towline attachment point and executes these maneuvers by pulling on or releasing a single control rope which attaches to the towline. The towline, in turn, is fastened to the stern of the sled.

3,824,946
WATER JET PROPULSION UNIT
Douglas Macardy, and Ian William Kelly, both of 75 Beverly St. East Doncaster, Victoria, Australia
Filed Aug. 30, 1972, Ser. No. 284,913
Int. Cl. B63h *11/10*
U.S. Cl. 115—12 R 8 Claims



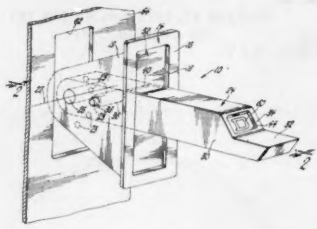
A water jet propulsion unit including two deflector blades which are located in the pressurized water stream emanating from a rotatable impeller and being movable about respective pivots by steering means so as to deflect the water stream to give directional control to an associated craft. The blades are moved in the same directin of rotation by the sterring means so as to emanate a parallel relationship. Actuating means are also connected to the blades and are operative to move the blades in opposite directions about their pivots so as to locate them in a position such as to direct the stream of water forwardly of the craft and thereby create rearward propulsion. The impeller is mounted in the housing which also carries the deflector blades and is arranged for attachment to the outside of the rear wall of the craft, and water is fed into that housing through a tunnel member secured within the craft and extending between the rear and bottom walls thereof.

3,824,947
COMPASS DEVICE FOR SAILING
Reijo Honkaranta, Espoo; Kauko Jarvenpaa, Helsinki, both of Finland, and Kevin Shephard, Wollstonecraft, Australia, assignors to Suunto Oy, Vanhakartano, Finland
Filed July 17, 1972, Ser. No. 272,527
Int. Cl. G01d *21/00*
U.S. Cl. 116—114 R 6 Claims



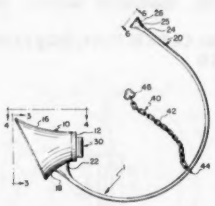
A compass device for use in sailing, which has a compass frame mountable in the sailcraft and comprising a compass card box provided with a main steering index and, outside this box external indexes which are called tack indexes. The invention is particularly characterized by the features that the compass card carries a tacking index and that said tack indexes are turnable about the center of the card box to make the central angle enclosed by them to be consistent with the vessel's angle of ascent, and that said tack indexes may be set so that the tacking index on the card becomes centered in the angle between them. Further, optional, characteristic features concern the provision on the card box of further, so-called scud indexes and their location, certain preferable arrangements for securing the positions of various indexes, and the coloring and other details of design of the indexes.

3,824,948
CONTROL LEVER ASSEMBLY
William L. Faloon, Dearborn, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed June 7, 1973, Ser. No. 367,758
Int. Cl. G09f *9/00*
U.S. Cl. 116—124 R 3 Claims



A position indicating lever assembly for controlling the operating range of a mechanical apparatus having a plurality of operating ranges, the assembly including an operating lever having a viewing portion thereon and adapted for pivotal movement relative to a fixed base through an included angle of less than 180°, a ribbon element attached at each end to the base and trained over a ribbon support within the lever, and a plurality of indicator symbols on the ribbon element, the ribbon element being shiftable relative to the lever in response to pivotal movement of the latter so that the indicator symbols sequentially index in the viewing portion to signal the position of the lever in terms of the operating range of the controlled mechanical apparatus.

3,824,949
WHISTLE DEVICE
Christopher J. Aquila, 38340 Parkway Dr., Willoughby, Ohio 44094
Filed Nov. 24, 1972, Ser. No. 309,169
Int. Cl. G10k *5/00*
U.S. Cl. 116—137 R 12 Claims

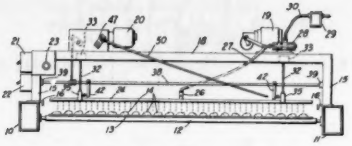


The disclosed whistle device comprises a whistle mounted within a sound-directing megaphone which is actuated through a flexible conduit and supported by a clip so that the whistle can be actuated at a distance from the operator's ear and the resulting sound directed in the general direction he is facing.

3,824,950
CONFECTION DECORATING MACHINE AND DRIVE TRANSFER

George D. Woody, 615 S. Pine St., York, Pa. 17405

Filed Mar. 20, 1972, Ser. No. 236,327
Int. Cl. B05c 5/00, 11/14; A23g 3/25
U.S. Cl. 118—14 13 Claims

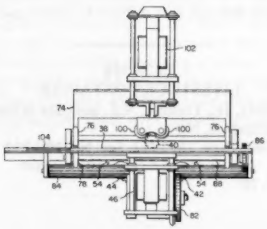


A decorator for imparting designs on the surfaces of candies, confections and cookies, including a continuously moving conveyor for carrying the item to be decorated and a dispensing tube having plural discharge openings which is supported above and extends across the conveyor. The dispensing tube is suspended by cables and is connected to a support bar through bell crank and links. A drive mechanism incorporates two eccentric drives, one connected to oscillate or reciprocate the dispensing tube back and forth in a direction across the path of the conveyor and the other being connected to the bell crank to oscillate or reciprocate the dispensing tube back and forth in the direction of conveyor travel. The drive features a change speed arrangement so that the relative rotational speeds of the two eccentrics may be altered. In one speed relation, the eccentrics are driven in unison and in the other speed relation, the dispensing tube is driven at twice the speed back and forth in the direction of conveyor travel than it is in the transverse direction.

3,824,951
FINGERPRINTING MACHINE

Allan D. Le Vantine, 18225 Rancho St., Tarzana, Calif. 91356, and Daniel L. Curtis, 1956 Ardmore Ave., Manhattan Beach, Calif. 90266

Filed Dec. 17, 1973, Ser. No. 425,287
Int. Cl. A61b 5/10
U.S. Cl. 118—31.5 10 Claims

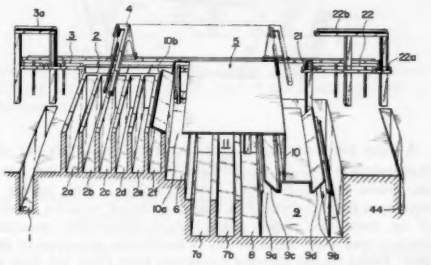


Apparatus for taking fingerprint impressions onto a fingerprint card is disclosed which includes a platen and means for retaining a fingerprint card on the platen. Drive means are provided for engaging the platen with the surface of a finger whose fingerprint is to be impressed upon the fingerprint card and for moving the platen in a path such that the platen contacts all portions of the surface of the finger which are to be impressed upon the fingerprint card and there is no slippage between the surface of the finger and the platen.

3,824,952
FINISH DIP PAINTING DEVICE OF METAL WORKS ON MASS PRODUCTION BASIS

Toshihiro Nagano, Shizuoka; Mastsuo Suzuki, Yaizu; Yoshio Sano, Shizuoka; Yasuo Aoshima, Shizuoka, and Shozo Suzuki, Shizuoka, all of Japan, assignors to Riken Light Metal Industries Co., Ltd., Shizuoka, Japan

Filed Jan. 4, 1973, Ser. No. 320,937
Claims priority, application Japan, Oct. 5, 1972, 47-100069; Oct. 5, 1972, 47-100070; Nov. 17, 1972, 47-114746
Int. Cl. B05c 11/12
U.S. Cl. 118—56 4 Claims

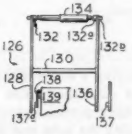


A device for finish dip painting metal works on mass production basis, consisting of an enclosed chamber wherein paint vessels, a setting space, a drying furnace, and chain conveyors are furnished so as to move racks carrying the metal works horizontally and vertically by the chain conveyors for dip painting, setting, and drying. The enclosed chamber communicates with the drying furnace for selectively receiving heat energy therefrom.

3,824,953
SUPPLEMENTAL SHEET-DISPENSING DEVICE FOR A TOILET-TISSUE DISPENSER

Philip Boone, 15 Fenwick Rd., Winchester, Mass. 01890

Continuation-in-part of Ser. No. 238,578, March 27, 1972, Pat. No. 3,744,448, which is a continuation-in-part of Ser. Nos. 678,600, Oct. 27, 1967, abandoned, and Ser. No. 715,768, March 25, 1968, Pat. No. 3,652,174, and a continuation-in-part of Ser. No. 257,745, May 30, 1972, abandoned, and Ser. No. 334,309, Feb. 21, 1973, and a continuation-in-part of Ser. No. 48,916, June 6, 1970, Pat. No. 3,707,945. This application May 1, 1973, Ser. No. 356,143
Int. Cl. B05c 11/02
U.S. Cl. 118—75 26 Claims



A compact auxiliary device providing wetted or self-wetting sheets for releasable proximate mounting in conjunction with a conventional toilet-tissue dispenser of dry sheets; comprises an inexpensive container or magazine component pre-loaded with the supplemental sheets. The magazine can be snapped into functional position rapidly. It serves an improved health care and cleanliness function.

3,824,954

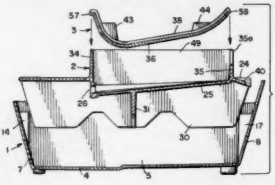
DEVELOPER TANK AND TROUGH ASSEMBLY

Alfred M. Hyosaka, Morton Grove, and Rudolph C. Mueller, Schiller Park, both of Ill., assignors to Speed-O-Print Business Machines Corporation, Chicago, Ill.

Filed Mar. 24, 1972, Ser. No. 237,975

Int. Cl. G03g *13/00*

U.S. Cl. 118—429 **2 Claims**



A three piece developer tank and trough assembly, for use in connection with an electrostatic photocopy machine, has a two piece trough member nested within a tank having a developer fluid therein. The trough member includes, as one of its members, paper guide means removably mounted therein, and such subassembly is removably mounted in the tank. Pump means delivers developer fluid from the tank to the trough and paper guide means during operation of the machine. The three pieces are held together in assembled relation preferably by quickly removable fastening means, such as spring clips.

3,824,955

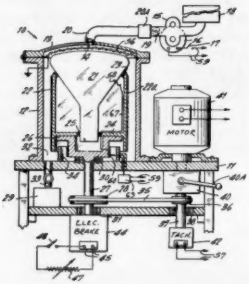
APPARATUS FOR COATING TELEVISION VIEWING TUBES

Alvin M. Marks, and Mortimer M. Marks, both of 153-16 10th Ave., Whitestone, N.Y. 11357

Filed May 15, 1972, Ser. No. 253,495

Int. Cl. B05c *11/14*

U.S. Cl. 118—500 **10 Claims**



A structure for applying a non-reflective coating to television viewing tubes is described. The structure includes a closed container in which a tube support may be positioned for receiving and rotating the tube and means for applying the coating as a solution on the viewing face. The viscosity of the coating solution and the speed of rotation are adjusted so that the coating is spread evenly over the tube face. The coating optionally contains a plurality of needle-shaped crystals which are normally oriented by the application of an electric field to the coating. A metal screen in the container acts as one terminal for the field while the aluminized layer on the phosphorescent coating within the tube acts as the other terminal. Various devices control the timing, speed of rotation, and the application of the solution.

3,824,956

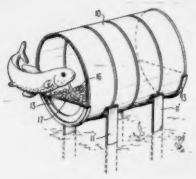
FISH BROODER OR REFUGE

Robert W. Presley, R.F.D. No. 1, Makanda, Ill. 62958

Filed June 22, 1973, Ser. No. 372,619

Int. Cl. A01k *61/00*

U.S. Cl. 119—3 **6 Claims**



An open-ended cylinder body has partial end closures to allow the formation of a gravel bed up to a predetermined level with the cylinder body resting on its side. Anchoring legs for the cylinder body may be provided as permanently attached strap elements or separately formed attachable spring legs. The brooder may be constructed in various lengths from a basic unit.

3,824,957

SPAT COLLECTOR

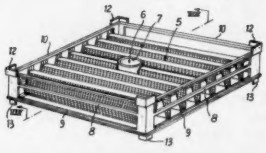
Lazare Nathan Halaunbrenner, 17, Boulevard Edgar Quinet, 92-Colombes, France

Filed Jan. 19, 1973, Ser. No. 325,157

Claims priority, application France, Jan. 25, 1972, 72.12473

Int. Cl. A01k *61/00*

U.S. Cl. 119—4 **10 Claims**



Spat collector which comprises a plurality of stackable plates made of a semi-rigid material, each of which plates comprises a series of strips disposed in the form of a louver and is provided with a central orifice, and a central member adapted to pass through said orifices to locate said plates in a stack.

3,824,958

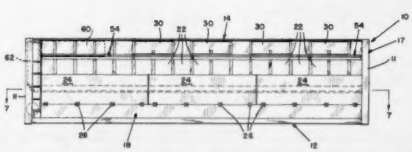
LIVESTOCK CONTAINER

Victor G. Parady, Jr., Trenton, N.J., assignor to Sea-Land Service, Inc., Elizabeth, N.J.

Filed Sept. 18, 1972, Ser. No. 290,232

Int. Cl. G61d *03/00*; **A01k** *01/00*

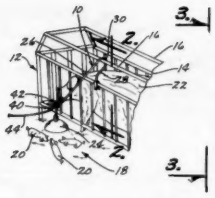
U.S. Cl. 119—10 **6 Claims**



A container for tranporting livestock adapted for over-the-road travel as well as for stacking interchangeably with other

cargo containers aboard a ship includes partitions for dividing the container into a plurality of stalls, self-contained feed and water storage means, removable grating floor means, and means to trap the liquid waste.

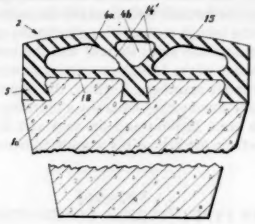
3,824,959
SUPPORT BRACKET
Charley B. Naig, Cylinder, Iowa 50528
Filed Sept. 5, 1972, Ser. No. 286,190
Int. Cl. A01k *1/00*
U.S. Cl. 119—20 **5 Claims**



A circular rod includes an upstanding finger which extends through the loop of an electrical cord or hydraulic hose after the loop has been extended through the opening in the circular member. When a hydraulic hose is being supported, a lip is provided on the upstanding finger and extends over the bight portion of the hose and the hydraulic hose is supported above the tongue of a farm implement. The bracket may also be mounted on a farrowing crate to suspend a heating unit over pig areas. An elongated rod bent upon itself and having a U-shaped clamp at the opposite end may engage a horizontally disposed member of the farrowing crate while the bight of the rod engages a horizontally spaced apart second rod of the farrowing crate. Alternatively, a straight elongated rod may have a u-shaped clamp at its end opposite the circular portion for and engaging a structural member of a farrowing crate. The U-shape clamp may extend either parallel or perpendicular to the elongated rod and may have a pin with ring or safety pin as a fastener to close the open end of the clamp. A further embodiment of a support for a heating unit includes an elongated rod having a U-shape clamp at its inner end for engaging a horizontal rod of a pig crate and an inverted V-shape leg structure engages a rod intermediate its ends with the lower ends of the legs of the leg structure engaging a second horizontally disposed crate member and a portion of the elongated rod extends away from the crate and includes spaced apart portions for supporting heating units over side-by-side separated pig areas.

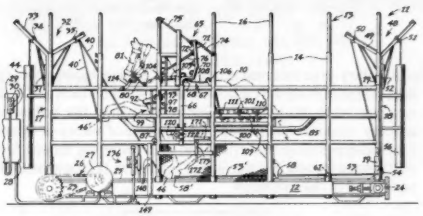
3,824,960
FLOOR STRUCTURE
Karl Kaltenbock, Gallneukirchen, Austria, assignor to Semperit Aktiengesellschaft, Vienna, Austria
Filed Apr. 2, 1973, Ser. No. 347,183
Int. Cl. E04f *15/10*
U.S. Cl. 119—28 **15 Claims**

A concrete underfloor has an arched upper surface provided with recesses. A plurality of floor lining strips of rubber or plastics are arranged side by side on the underfloor. Each strip has a bottom part in contact with the concrete, at least two downward-directed projections engaging the corresponding recesses in the underfloor, an arched top portion integral



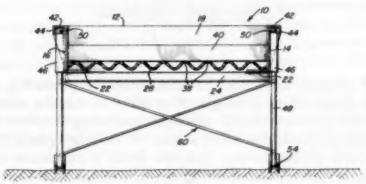
with the bottom portion in the region of the projections and defining with the intermediate part of the bottom portion an elongated cavity.

3,824,961
HORSE TRAINING APPARATUS
Joe A. Webb, E. Lincoln St., Searcy, Ark. 72143
Filed May 29, 1973, Ser. No. 364,632
Int. Cl. A01k *15/00*
U.S. Cl. 119—29 **22 Claims**



A horse training apparatus including an enclosure frame for receiving a horse and a positively driven, longitudinally movable tread member, and attachment means connected to the frame, and to various portions of the horse's body, particularly the hooves, for training a horse to perform various gaits.

3,824,962
FEED TROUGH WITH REPLACEABLE BOTTOM
Arnold J. Topham, P.O. Box 355, Booneville, Ark. 72927
Filed May 8, 1973, Ser. No. 358,270
Int. Cl. A01k *05/00*
U.S. Cl. 119—61 **6 Claims**



An elongated trough, including opposite end and sidewalls, and longitudinally spaced transversely extending brace members secured between the trough sidewalls. One end wall of the trough terminates downwardly above a horizontal plane containing the upper surfaces of the brace members and an elongated bottom wall is lengthwise receivable beneath the

one end wall for positioning on and support from the transverse brace members. The one sidewall includes upwardly retractable abutment means disposed in registry with the adjacent end of the bottom wall to releasably prevent endwise retraction of the bottom wall beneath the one end wall of the trough and the trough includes longitudinally spaced legs supported from opposite sides thereof and the lower ends of the legs on each side of the trough are interconnected by means of horizontal runner members. Further, the opposite ends of the trough include towing eyes whereby a plurality of troughs may be towed in train fashion and the legs and the runners supported therefrom are releasably supported from the trough.

3,824,963

ROTARY TYPE INTERNAL COMBUSTION ENGINE

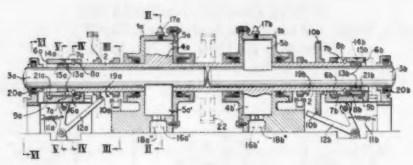
Takeichi Eda, 989 Kamihinata, Kanuma, Japan

Filed Jan. 4, 1973, Ser. No. 320,938

Claims priority, application Japan, Aug. 14, 1972, 47-80726

Int. Cl. F02b *53/00*

U.S. Cl. 123—8.47 **4 Claims**



A rotary-type internal combustion engine having two cylinders interconnected by a hollow shaft within which are located two coaxial shafts in end-to-end relationship; the hollow shaft and the coaxial shafts each having pairs of vanes in alternate relationship within the cylinders; and camming means for the shafts so as to vary the particular operative relationships of the vanes and of the cylinders.

3,824,964

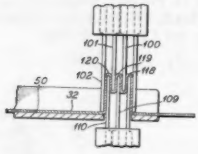
AUTOMATED PLEATER FOR DRAPERIES

Richard Burns Ryan, Northbrook, Ill., assignor to Edward J. Ryan and Patricia K. Ryan, both of Glenview, Ill.

Filed Mar. 29, 1973, Ser. No. 346,126

Int. Cl. A41h *43/00*

U.S. Cl. 223—30 **23 Claims**



A pleating apparatus for automatically producing successive pleats along a length of drapery or curtain material at regular predetermined spacings, including a pleat forming device positioned at a first station for folding a plurality of juxtaposed pleats in the material with a minimum stressing thereof, and a pleat securing device such as a sewing machine positioned at a second station to secure the formed pleats together into a permanent pinch pleat, and including an advancing mechanism to automatically move the formed pleats from the first station or forming area a predetermined distance to the second station or sewing area and thereby regularly space successively formed pinch pleats along the material. The pleat forming device gathers the material ahead of the device to form the pleat so that the material in and beyond the device is not stressed and the spacing between pleats can be adjusted by varying the space between the first and second stations.

3,824,965

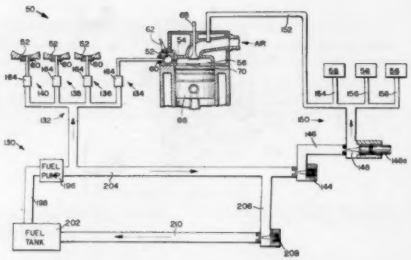
FUEL SYSTEM

Lawrence G. Clawson, Dover, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Continuation-in-part of Ser. No. 219,385, Jan. 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 32,289, April 27, 1970, abandoned, which is a continuation-in-part of Ser. No. 776,285, May 23, 1968, Pat. No. 3,508,530. This application May 30, 1972, Ser. No. 257,710

Int. Cl. F02b *17/00*

U.S. Cl. 123—32 R **10 Claims**



A low pressure direct injection fuel system for preignition engines in which the main fraction of the compressed charge of the engine is ignited by exposure to a hot gas exiting from a smaller volume spark ignition prechamber forces fuel into each chamber and/or prechamber of the engine during all or a segment of the low pressure scavenging periods of the engine cycle via passages containing valves to prevent backflow of fuel and gases during the high pressure period of the engine cycle. The engine runs unthrottled solely on the prechamber fuel charge and the amount of fuel fed to the prechamber is decreased with increased engine load so that a uniform combustible charge is present in the prechamber during all engine load and speed regimes.

3,824,966

AIR-FUEL SUPPLY MIXTURE CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

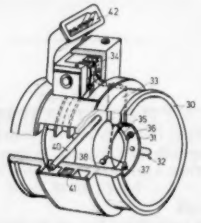
Rolf Schneider, Winnenden, and Hans-Martin Muller, Asperg, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 11, 1972, Ser. No. 296,601

Claims priority, application Germany, Oct. 18, 1971, 2151774

Int. Cl. F02b *3/00*

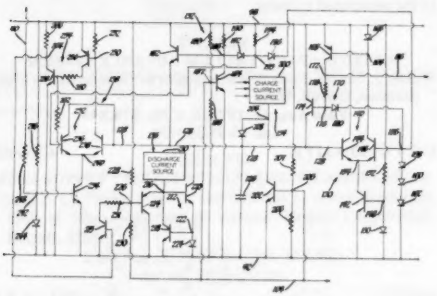
U.S. Cl. 123—32 AE **10 Claims**



To provide an accurate determination of air flow in the inlet manifold of an internal combustion engine and, more particu-

larly, for a fuel injection system, a guide ring is located in the intake air duct to the engine, spaced from the walls of the engine, and within the guide ring, a temperature sensitive resistor is arranged in the form of a loop, the resistor being heated, the heating current to maintain the temperature sensitive resistor at a predetermined temperature being a measure of air flow independently of turbulence occurring within the inlet tube.

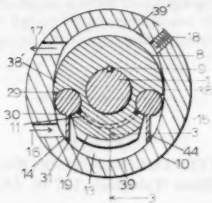
3,824,967
ELECTRONIC FUEL INJECTION SYSTEM
Colin C. Gordon, Cincinnati, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Oct. 30, 1972, Ser. No. 302,034
Int. Cl. F02d *5/00*
U.S. Cl. 123—32 EA **3 Claims**



A control voltage is developed across a capacitor. In synchronization with the operation of an internal combustion engine, the capacitor is charged with a charge current to increase the control voltage from an intermediate level to a peak level. In response to the arrival of the control voltage at the peak level, the capacitor is discharged with a first discharge current to decrease the control voltage from the peak level back to the intermediate level. In response to the arrival of the control voltage back at the intermediate level, the capacitor is further discharged with a second discharge current to decrease the control voltage from the intermediate level to a base level. The peak level of the control voltage is determined as a preselected function of a primary engine operating parameter such as intake air pressure. At least one of the charge current and the first discharge current of the capacitor is determined as a preselected function of a secondary engine operating parameter, such as engine temperature, which is multiplicatively related to the primary engine operating parameter. At least one of the second discharge current of the capacitor and the intermediate level and the base level of the control voltage is determined as a preselected function of a secondary engine operating parameter, such as battery supply voltage, which is additively related to the primary engine operating parameter.

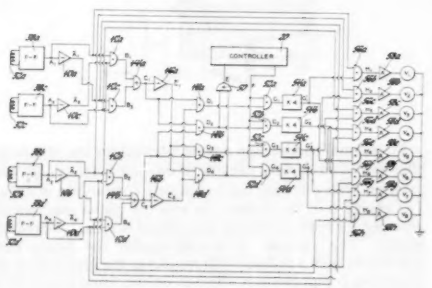
3,824,968
ROTARY INTERNAL COMBUSTION ENGINE
Ivan S. Brumagim, North Warren, Pa., assignor to Secondary Processing Systems, Inc., Warren, Pa.
Filed Sept. 7, 1972, Ser. No. 286,972
Int. Cl. F02b *55/14*
U.S. Cl. 123—8.45 **13 Claims**

A rotary internal combustion engine consisting of a rotor housed within a stator forming one or more dual purpose compression and combustion chambers, the inner periphery of said chamber being a sector of said rotor, its ends being hinged to said rotor in such manner that both the compression and firing of the fuel forces said ends into pressure tight contact with the inner surface of said stator, its outer periphery being formed by said inner surface, the contour of said inner surface being adapted to twice maximize and twice minimize the volume of each said chamber at each revolution of the rotor, thereby providing within each chamber a succession of induc-



tion, compression, combustion, expansion and exhaust of fuel at each revolution of the rotor, said rotor being adapted by means of a groove along its surface to transfer the gases thus inducted and compressed in the compression chamber to a point of ignition provided at the beginning of the expansion chamber.

3,824,969
ELECTRONIC FUEL INJECTION SYSTEM
Lamonte R. Edison, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Nov. 24, 1972, Ser. No. 309,259
Int. Cl. F02m *51/00*
U.S. Cl. 123—32 EA **1 Claim**



An internal combustion engine includes a group of eight fuel injectors for applying fuel to the engine. A set of four first order timing signals are developed in synchronization with engine operation. The set of first order timing signals collectively contain eight magnitude permutations per engine cycle each defining the start of injection for a corresponding one of the fuel injectors. The set of four first order timing signals is mixed to form a first set of four second order timing signals, which is mixed to form a second set of two second order timing signals, which is mixed to form a third set of four second order timing signals, which is mixed to form a single third order timing signal containing all eight magnitude permutations per engine cycle. A single third order pulse train is developed in synchronization with the single third order timing signal. The single third order pulse train contains eight control pulses per engine cycle each initiated in response to one of the eight magnitude permutations per engine cycle in the single third order timing signal. The length of each control pulse defines the period of injection for a corresponding one of the fuel injectors in time compressed nonoverlapping relationship. The

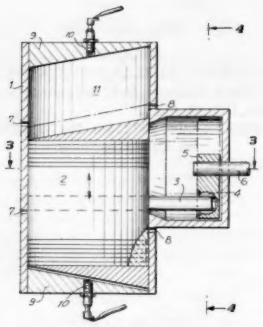
single third order pulse train is separated in response to the third set of second order timing signals to form a set of four second order pulse trains collectively containing all eight control pulses per engine cycle. The length of each control pulse in the set of second order pulse trains is extended to define the period of injection for a corresponding one of the fuel injectors in time expanded overlapping relationship. The set of second order pulse trains is separated in response to the set of first order timing signals to form a series of eight first order pulse trains each containing control pulses which are applied to energize a corresponding one of the group of eight fuel injectors.

3,824,970

INTERNAL COMBUSTION ENGINE

Ernest Amery, Hotel Woodstock, 127 W. 43rd St., New York, N.Y. 10036

Filed Oct. 24, 1972, Ser. No. 300,230
Int. Cl. F02b *53/00, 75/16*
U.S. Cl. 123—45 R **4 Claims**



An internal combustion engine adapted for use in automobiles and other devices capable of operation under high compression while effecting more complete combustion of its fuel. The engine is of the piston type with the piston mechanically arranged for both oscillatory and related vertical reciprocitory motion. The cylinder is double-headed the heads being oriented in such a manner with respect to the piston faces that maximum compression is effected on the firing stroke of the engine. The double head cylinder permits more complete combustion of the gasoline mixture.

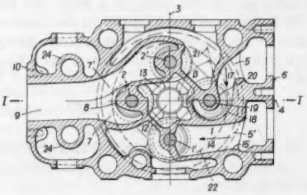
3,824,971

INTERNAL COMBUSTION ENGINE WITH TWO INTAKE AND TWO EXHAUST VALVES

Othmar Skatsche; Gerhard Thien, and Karl Kirchweger, all of Graz, Austria, assignors to Hans List, Graz, Austria

Filed Aug. 2, 1972, Ser. No. 277,289
Claims priority, application Austria, Aug. 3, 1971, 6787/71
Int. Cl. F02m *35/10;* **F02b** *31/02*
U.S. Cl. 123—75 B **1 Claim**

An internal combustion engine with two suspended intake valves for each cylinder, of which the first intake valve is connected to a tangential duct extending approximately in transverse relation to the engine, and the second intake valve is connected to an inlet port emerging from the same cylinder-head sidewall as the first-mentioned inlet port and extending approximately in the longitudinal direction of the engine and terminating as a spiral, wherein the axis of the first intake valve is located approximately in the longitudinal median



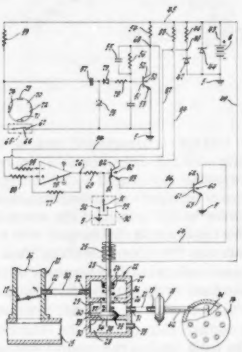
plane of the engine and the axis of the second intake valve is situated in a transverse plane of the engine including the axis of the associated cylinder.

3,824,972

IGNITION SPARK VACUUM ADVANCE SYSTEM

Walter J. Sattler, Flint, Mich., assignor to General Motor Corporation, Detroit, Mich.

Filed Aug. 11, 1972, Ser. No. 279,844
Int. Cl. F02p *5/04*
U.S. Cl. 123—117 R **6 Claims**



An ignition spark vacuum advance system for use with motor vehicle internal combustion engines. An operational amplifier responsive to a vehicle speed signal and a reference signal produces a control signal during acceleration to a speed of a selected magnitude and during deceleration at a speed less than the selected magnitude. The control signal triggers a switching transistor conductive to complete an energizing circuit for the operating coil of a two-way valve which normally establishes a vacuum connection between the carburetor vacuum spark advance port and the associated spark advance vacuum unit vacuum port and, upon the energization of the operating coil, vents the spark advance vacuum unit vacuum port to atmosphere. A temperature sensitive switch is operated to the circuit closed condition with engine temperatures less and greater than a selected engine temperature range to inhibit the switching transistor.

3,824,973

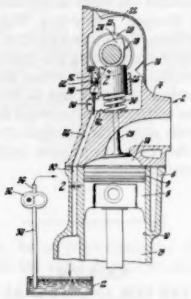
CYLINDER HEAD OIL DRAIN SYSTEM

Volker W. Harhaus, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 1, 1973, Ser. No. 366,002
Int. Cl. F02f *9/02*
U.S. Cl. 123—119 B **2 Claims**

An oil drain system for an overhead camshaft internal combustion engine includes a jet pump nozzle having an intake

end in communication with the main oil gallery of the cylinder head and a nozzle end operative to direct a stream of oil under



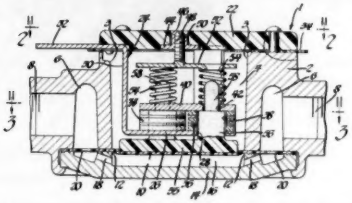
pressure into a cylinder head drain passage, whereby the drain flow of oil from the cylinder head to the engine crank case is improved.

3,824,974

FUEL SUPPLY SYSTEM WITH PRESSURE REGULATOR

Frank E. La Flame, Dayton, and William L. Sones, Kettering, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 3, 1972, Ser. No. 303,483
Int. Cl. F02m *51/00*
U.S. Cl. 123—136 **1 Claim**



A fluid pressure regulator to control the pressure of fuel pumped by an electric motor fuel pump. Carbon piles are sandwiched between two conducting plates in series with the fuel pump motor; springs cause the conducting plates to compress the carbon piles between them; and a chamber in the fuel line down-stream from the pump has a flexible diaphragm linked to one of the conducting plates to vary the pressure on the carbon piles inversely with the pressure in the fuel line.

3,824,975

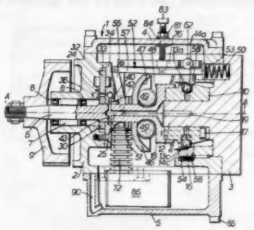
FUEL METERING DEVICE

Donald Bastow, Nullions Woodlands End, Mells, near Frome, Somerset, England

Filed Sept. 5, 1972, Ser. No. 286,259
Int. Cl. F02m *39/00*
U.S. Cl. 123—139 AC **12 Claims**

A device, for supplying fuel in the correct and desired quantity to an internal combustion engine employing spark ignition, compensates for the variation in volumetric efficiency of the engine with engine speed.

The device comprises a fuel injection pump of variable delivery and with independent outlets equal in number to the cylinders of the engine to be supplied. The pump is driven from the engine through drive means of the device which includes mechanically-operating means for sensing variations in the engine speed and for adjusting the pump delivery in dependence on the speed.



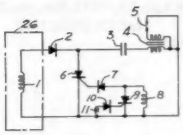
The pump outlets may supply injectors which inject into either the inlet passages or ports of the individual engine cylinders, or directly into the cylinder combustion spaces.

3,824,976

CAPACITOR CHARGE-DISCHARGE TYPE IGNITION SYSTEM FOR USE IN A TWO-CYCLE INTERNAL COMBUSTION ENGINE

Mitsuo Katsumata; Mitsunori Miyamoto, and Kiyoshi Shirai, all of Numazu, Japan, assignors to Kokusan Denki Co. Ltd., Namazu, Japan

Filed Aug. 30, 1972, Ser. No. 285,069
Int. Cl. F02p *1/00*
U.S. Cl. 123—148 E **13 Claims**



A capacitor charge - discharge type ignition system for use in a two-cycle internal combustion engine comprising a capacitor to be charged by a suitable power source; ignition coil means through the primary coil of which discharge current from said capacitor flows; a signal source for developing a signal output at the time of ignition; and a gate controlled rectifier for determining said time of ignition under the control of said signal output, said ignition system including means for preventing said engine from rotating in the reverse direction and said means being adapted to short-circuit the charging power source thereby to prevent the charging current from the source from flowing through the capacitor or the signal source thereby to prevent the igniting current from the signal source from flowing through the gate controlled rectifier when the engine rotates in the reverse direction.

3,824,977

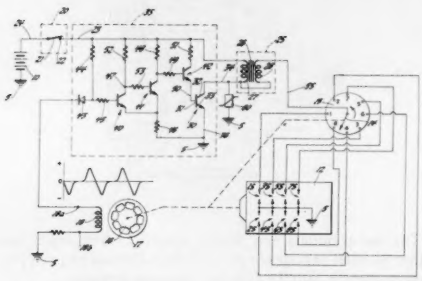
INTERNAL COMBUSTION ENGINE IGNITION SYSTEM

Robert E. Campbell; Lewis R. Hetzler, and Gerald O. Huntzinger, all of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 23, 1973, Ser. No. 418,248
Int. Cl. F02p *3/02*
U.S. Cl. 123—148 E **5 Claims**

An internal combustion engine ignition system of the inductive type which provides a rapid rise time ignition spark potential and a long duration arc. The primary winding of the ignition coil has an inductance valve which, with a specific ener-

gizing current, will provide sufficient stored energy to maintain an ignition arc for a predetermined duration, of the order of 800 microseconds, for example. The ignition coil secondary to primary turns ratio is selected to be of the order of 60:1 to provide a predetermined rise time of the ignition spark potential, of the order of 40 microseconds, for example. To prevent the destruction of the ignition coil primary winding energizing circuit switching device in the event of an open secondary winding output circuit, a metal oxide varistor is connected in shunt across the current carrying elements thereof.

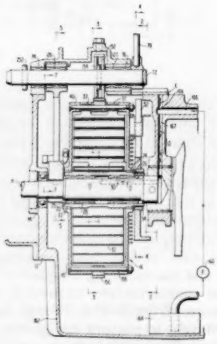


3,824,978

METHOD AND APPARATUS FOR STARTING AN INTERNAL COMBUSTION ENGINE

Merle Winfield Paquette, deceased, late of Los Angeles, Calif. (by Richard N. Paquette, petitioner), assignor to McCulloch Corporation, Los Angeles, Calif.

Filed Apr. 24, 1973, Ser. No. 354,087
Int. Cl. F02n *5/02*
U.S. Cl. 123—179 S **23 Claims**



A method and apparatus for starting an internal combustion engine. The apparatus includes a convolute spring disposed about an arbor which in turn is coaxially mounted upon a crankshaft of the engine. The spring serves to drive the crankshaft through a one-way clutch operably connected between the arbor and the crankshaft. The spring is fastened at the other end to a spring casing which is mounted for unidirectional rotation about the crankshaft. A spring rewind drive train drivingly connects the crankshaft with the spring casing and is operable to rotate the spring casing to rewind the starter spring upon starting of the internal combustion engine. A hydraulic system is provided for automatically resetting a starter spring release to rewind the starter spring upon starting of the engine. A hydraulic lock-out means automatically terminates the rewinding operation upon winding the spring to a predetermined extend. The lock-out precludes overwinding and excessive wear during operation of the engine.

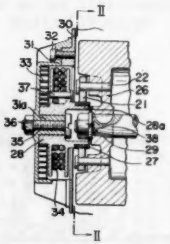
The method includes the steps of releasing a spring biased arbor connected through a one-way clutch to the engine crankshaft, transmitting torque energy from a wound spring to the engine crankshaft for rotating the crankshaft and starting the internal combustion engine. Further, the method includes hydraulically resetting the arbor arm to stop rotation thereof automatically upon starting of the internal combustion engine, rewinding the starter spring for subsequent use, and hydraulically terminating the rewinding process upon the starter spring achieving a rewound condition.

3,824,979

RECOIL STARTER FOR AN INTERNAL COMBUSTION ENGINE

Kazuya Tajika, Ono, and Hidenori Shimizu, Akashi, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe-shi, Hyogo-ken, Japan

Filed Sept. 5, 1972, Ser. No. 286,040
Int. Cl. F02n *3/02*
U.S. Cl. 123—185 A **6 Claims**



A recoil starter for an internal combustion engine having a rotatable reel disposed on an engine body and adapted to be rotated in one direction by pulling a length of rope, said reel being provided with a boss protruding therefrom toward a flywheel of the engine. A cylindrical friction member is disposed around the outer periphery of the boss. A pair of cams are provided on the flywheel at two positions opposing to the friction member, each of the cams being brought into engagement with said friction member as the reel is rotated in said one direction and released from the engagement with the friction member under the influence of a centrifugal force produced by increased speed of the engine.

3,824,980

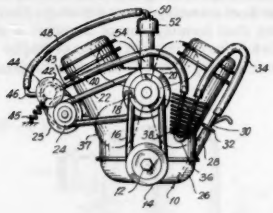
VEHICLE INTERNAL COMBUSTION ENGINE LUBRICATING OIL COOLING AND FILTERING CIRCULATION SYSTEM

Jesse R. Hollins, 40 Stoner Ave., Great Neck, N.Y. 11021

Filed Nov. 13, 1972, Ser. No. 305,739
Int. Cl. F01m *5/00;* **F16n** *39/06*
U.S. Cl. 123—196 AB **2 Claims**

A system including a calibrated oil measuring tube which partially extends into the oil crank case. An oil cooling heat exchanger is provided and means connects the calibrating

tube to the heat exchanger. A pump circulates oil from the crank case via the calibrating tube through the heat exchanger



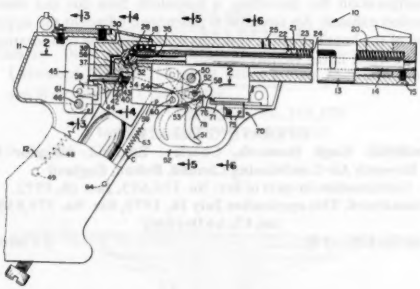
to the oil fill tube. An oil filter filters the oil discharged from the pump prior to the same being transferred to the oil fill tube.

3,824,981

SEMI-AUTOMATIC B-B PISTOL WITH TRIGGER-CONNNECTED LINKAGES

James W. Crane, Fairport, and David R. Hand, Newark, both of N.Y., assignors to Crosman Arms Company, Inc., Fairport, N.Y.

Filed Dec. 13, 1972, Ser. No. 314,761
Int. Cl. F41b *11/06*
U.S. Cl. 124—11 R **10 Claims**



In this pistol an operating pin on the trigger is connected by a linkage to the hammer, and by a lever to a cylindrical loader that pivots at the inner end of the barrel between loading and firing positions respectively. The trigger is spring-loaded to its released position. In this position the loader is in loading position in which a duct therethrough will receive a BB projectile from the magazine. When the trigger is pulled, the loader is pivoted to swing the duct therethrough and the BB therein into registry both with a gas inlet port and the bore of the barrel and the hammer is tripped to open the valve which supplies the propellant gas to the duct and the ball is propelled from the barrel.

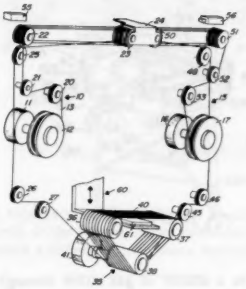
3,824,982

MACHINE FOR CUTTING BRITTLE MATERIALS

John L. Bowman, Elmhurst, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Continuation of Ser. No. 209,804, Dec. 20, 1971, abandoned. This application July 2, 1973, Ser. No. 376,045
Int. Cl. B28d *1/08*
U.S. Cl. 125—16 **7 Claims**

A carriage having a pair of pulleys mounted thereon and mounted for reciprocating movements between a pair of fixedly positioned pulleys with switches positioned at each end of the path so as to be activated by the carriage as it reaches either end of the path. A plurality of pulleys mounted in spaced apart relationship to define a cutting area, one of said pulleys being driven by a reversible motor connected to the two switches to reverse each time the carriage reaches an end



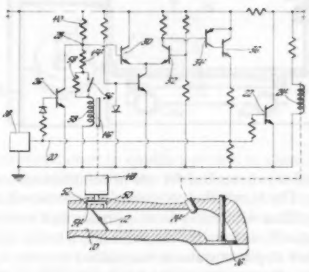
of the path. A continuous strand of wire extending from a wire supply to a take-up means and engaged around the pulleys of the carriage, the pulleys associated with the carriage and the pulleys defining the web to follow a continuous path from the supply to the take-up.

3,824,983

ACCELERATION ENRICHMENT

Francis A. Sciabica, Penfield, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 31, 1972, Ser. No. 240,184
Int. Cl. F02d *5/02*
U.S. Cl. 123—32 EA **1 Claim**



In a speed-density fuel injection system, a pressure transducer receives pressure signals from the air induction passage below the throttle and from a port located closely above and traversed by the throttle. The atmospheric pressure sensed by the port during closed throttle operation increases the induction passage pressure signal otherwise delivered to the transducer. As the throttle is opened, increased fuel flow is provided for acceleration enrichment until the increased pressure signal reduces to induction passage pressure.

3,824,984

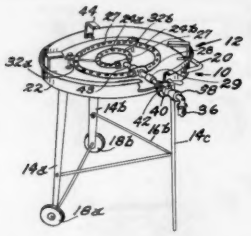
CHARCOAL GRILL CONVERSION APPARATUS

Marvin C. Swanson, 714 Highwood, Greencastle, Ind. 46135, and Harold R. Swanson, 4232 N. Octavia Ave., Norridge, Ill. 60634

Filed Feb. 10, 1972, Ser. No. 225,105
Int. Cl. A47j *37/07*; F24b *3/06*
U.S. Cl. 126—25 R **2 Claims**

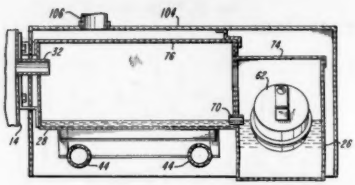
A device is disclosed for converting a standard charcoal grill to a gas fired cooking apparatus. The burner comprises a series of rings which have upwardly facing apertures which are

disposed concentrically about a central axis of a typical bowl shaped charcoal grill. Rigid members depend from the rings and rest upon the bottom of the grill (to support the burner generally parallel to the open top portion thereof). The rings



are connected to a source of gas either through the side or over the side of the grill. In addition, a special grate fabricated from sheet metal for supplying a greater proportion of conductive heat to the food being cooked may be suspended above the grill.

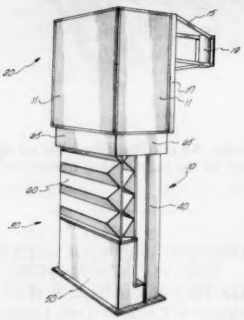
3,824,985
HUMIDIFIER
Sidney W. Hetherington, 5540 Madison Rd., Cincinnati, Ohio 45227
Filed May 1, 1972, Ser. No. 248,981
Int. Cl. F24f *3/14*
U.S. Cl. 126—113 **15 Claims**



A humidifier is described for use in combination with a hot air furnace. The humidifier comprises a reservoir which is automatically filled with water from a pressurized water line or supply. Water flows from the reservoir into a boiler and a relatively shallow depth of water is maintained therein. A burner beneath the vaporizer pan comprises a pilot flame which preheats the water, and burner elements which, on demand of a humidistat signal, are fired to generate steam in the boiler. This steam is then introduced into the cold air plenum of the furnace and circulated through the duct system thereof by the furnace blower which is also actuated when there is a demand for increased humidity.

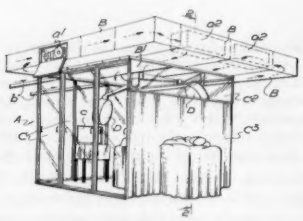
3,824,986
SUBMERSIBLE POOL HEATER
Robert M. Ramey, North Hollywood, Calif., assignor to Teledyne, Inc., Los Angeles, Calif.
Filed Jan. 17, 1972, Ser. No. 218,421
Int. Cl. F24h *1/20*
U.S. Cl. 126—360 **14 Claims**

A pool heater is disclosed that is adapted to be partially submersible in the water contained in the pool. The pool heater comprises a vent assembly, which is adapted to be supported above the pool water level, and a duct assembly, which is adapted to be submersed below the pool water level. The vent assembly comprises a vented outer housing having an exhaust stack located therein. The top cover plate of the outer housing includes an aperture formed therein. The exhaust stack terminates slightly below the aperture to enable cool inlet air to be drawn therethrough cooling the outer housing surrounding the stack. The duct assembly forms a U-shaped configuration having an inlet duct forming one of the legs. A combustion chamber is formed at the bottom of the U-shaped configuration, while the other leg of the U-shaped configuration forms



heat exchange conduits. Radiant plates are located within the combustion chamber which function to feed back radiant energy into the burning air fuel thereby expediting the combustion. The heat exchange conduits are formed in a zigzag configuration for providing a turbulent flow for the combustion exhaust. An aquastat is positioned adjacent the upper end of the heat exchange conduits for sensing the temperature of the water in the vicinity thereof.

3,824,987
OPERATING THEATRES
Frederick Hugh Howorth, Chorley, England, assignor to Howorth Air Conditioning Limited, Bolton, England
Continuation-in-part of Ser. No. 216,693, Jan. 10, 1972, abandoned. This application July 16, 1973, Ser. No. 379,858
Int. Cl. A61b *19/00*
U.S. Cl. 128—1 R **5 Claims**



An operating theater comprising a chamber closed at the top by a ceiling surrounded by a plenum chamber provided with ducts through which sterile air is drawn from outside the chamber and discharged vertically downwards from tubes of porous textile material having along the bottom of each section inserts of a knitted fabric of greater air permeability than the remaining tube wall to give directional control of the air flow, a rail being mounted on the underside of the plenum chamber from which are suspended on three sides removable interchangeable panels extending from the rail to a floor and on the fourth side a curtain to give access for an operating table and patient, with means for extracting contaminated air from the patient.

3,824,988

ULTRASOUND DOPPLER APPLICATOR

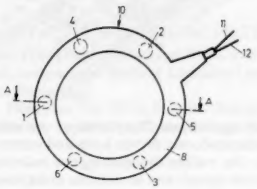
Richard Soldner, Erlangen, and Gerhard Naefe, Erlangenbruck, both of Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Jan. 30, 1973, Ser. No. 328,147

Claims priority, application Germany, Jan. 31, 1972, 22004474

Int. Cl. A61b *5/00*

U.S. Cl. 128—2 V **12 Claims**



An ultrasound Doppler applicator is used for determining the movement of internal body parts the position of which is variable relatively to the applicator, particularly fetal heart movement. The invention is particularly characterized by the provision of a plurality of ultra sound sending oscillators and a plurality of ultra sound receiving oscillators carried by a ring and distributed over the entire ring.

3,824,989

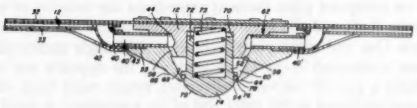
ANIMAL ESTRUS DETECTOR

Tommy Dean Horner, 1450 Kendall, Apartment 5G, Lakewood, Wis. 80214, and Charles Ewing, Jr., 6004 Johnson Way, Arvada, Colo. 80004

Filed May 31, 1973, Ser. No. 353,378

Int. Cl. A01k *11/00*; **A61b** *10/00*

U.S. Cl. 128—2 H **8 Claims**



A heat or estrus indicator for animals has been devised which is in the form of a harness or collar adapted to be releasably attached to the bull animal with an applicator unit for dispensing a marker material onto the back of the female animal during simulated or actual coition, the heat indicator being characterized by metering the supply of marker material through the applicator from one or more reservoirs which are incorporated into and form a part of the harness.

3,824,990

METHOD AND APPARATUS FOR PRODUCING SAMPLE ELECTROCARDIOGRAMS

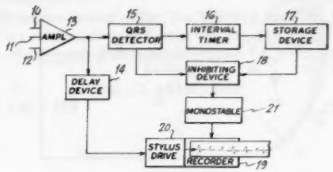
Gerhard M. Baule, Camillus, N.Y., assignor to Instruments for Cardiac Research, Inc., Syracuse, N.Y.

Filed June 30, 1971, Ser. No. 158,481

Int. Cl. A61b *5/04*

U.S. Cl. 128—2.06 G **5 Claims**

An electronic instrument for medical use measures the time intervals between QRS complex portions of the electrical signal wave representing heartbeats. The intervals are quantized in digital form. The occurence of each subinterval is stored. Every incoming time interval is compared with the stored values. The instrument, upon receiving and comparing a novel interval, for example, either too short or too long, will activate an electrocardiograph recorder. The instrument



produces a relatively small number of electrocardiographic (ECG) records, in the form of paper strips, but those strips are likely to contain a history of arrhythmic heart activity.

3,824,991

THERAPEUTIC CHAIR FOR EXERCISING BACK MUSCLES

William J. Whitaker, 3517 Imperial Hwy., Lynwood, Calif. 90262

Filed Sept. 5, 1972, Ser. No. 285,994

Int. Cl. A61h *1/00*

U.S. Cl. 128—24 R **7 Claims**

A therapeutic chair to enable a person to exercise his back muscles. The chair includes a base that sets on the floor and includes a seat rockably mounted on the base to rock from side to side about a horizontal axis. To the base there is fixed a guide that extends over the person's head. The guide is adjustable to accommodate various size people so that the guide just contacts the head of the person sitting on the seat, to notify the person to keep his head steady. Mounted within the base is an electric motor with an eccentric crank that is coupled to the seat to rock it from side to side. A timer is provided in series with the electric motor, which cuts off current to the motor after a predetermined time.

3,824,992

PRESSURE GARMENT

James E. Nicholson, Quincy, and Charles S. Lipson, Newton, both of Mass., assignors to Clinical Technology Incorporated, Brighton, Mass.

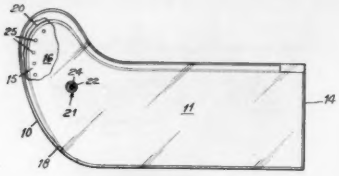
Filed Mar. 16, 1973, Ser. No. 342,098

Int. Cl. A61h *1/00*

U.S. Cl. 128—24 R **6 Claims**

A garment to provide pulsating pressure to a lower human extremity for aiding blood circulation in the extremity and having an outer nonelastic plastic envelope sealed to an internal relatively soft envelope providing an air space therebetween for the application of pulsating pressure uniformly to a limb inserted within the inner envelope. The inner envelope has a common seam along part of its length

with the outer envelope to prevent inflation pressure from displacing the two envelopes. A system of apertures in the inner



envelope provide for a limited gaseous passage of air from the pressurized space between the two envelopes to the surface of a limb encased within to provide breathing air for the skin.

3,824,993

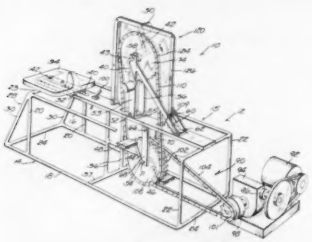
PHYSIO-THERAPY METHOD AND APPARATUS

James L. Grant, 602 S. University, Beaver Dam, Wis. 53916

Continuation-in-part of Ser. No. 168,991, Aug. 4, 1971, abandoned. This application Jan. 2, 1973, Ser. No. 320,362

Int. Cl. A61h *1/02*

U.S. Cl. 128—25 R **6 Claims**



Apparatus for teaching brain-damaged children or adults the homolateral gestalt and cross-pattern gestalt includes commonly driven foot cranks and hand cranks which are adjustable to afford use of the cranks in the proper angular phase for cross-pattern therapy or homolateral therapy. The apparatus includes a motor and a variable speed drive to rotate the cranks and manipulate the patient's limbs in the proper sequence to teach the desired gestalt. A clutch in the drive train enables free wheeling of the cranks by the muscle power of the patient as learning progresses with use of the apparatus in the driven mode.

3,824,994

RECIPROCATING WALKER

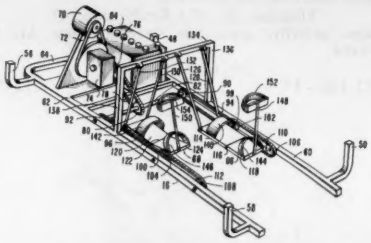
Raymond Henry Soderberg, Sr., Panorama City, Calif., assignor to R. S. Reciprocating Trainer Enterprises, Inc., North Hollywood, Calif.

Filed Jan. 29, 1973, Ser. No. 327,795

Int. Cl. A61h *1/02*

U.S. Cl. 128—25 R **24 Claims**

A walker in which an individual secured at the waist and having both feet attached to movable footboards is caused to undergo a complete reciprocating walking action in which the feet, angles, legs, hips and arms all move in normal walking fashion. Each footboard is centrally hinged to define a forward portion supporting the ball of the foot and a rearward portion supporting the heel of the foot and movable independent of the forward portion to create the up-down heel motion experienced in walking. The footboards which are coupled to endless chains so as to be reciprocatingly driven through endless cyclic loops of motion also include brackets secured to the rearward portions for bending and straightening the knees



during the walking motion. The frame of the walker may be mounted on independently driven belts and control apparatus added to make the walker drivable by the individual across a surface at variable speeds and in variable directions.

3,824,995

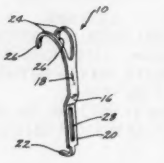
TROCHANTERIC PLATE

Phillip E. Getscher, and Henry G. Hesser, both of Lincoln, Nebr., assignors to Elizabeth A. Villiers, Lincoln, Nebr., a part interest

Filed July 24, 1972, Ser. No. 274,562

Int. Cl. A61f *5/04*

U.S. Cl. 128—92 B **5 Claims**



An elongated plate element extends on the exterior of the femur shaft and the greater trochanter across the adjacent ends. One end of the plate includes a right angle anchor element embedded in the femur shaft and the opposite end includes a pair of outwardly diverging return bend hook elements anchored in the outer end of the trochanter. A bend is provided in the plate element which positions the opposite portions in spaced apart parallel planes. An elongated slot is provided in the plate element and a pin extends through the slot into the femur shaft.

3,824,996

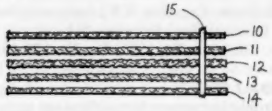
HIGHLY ABSORBENT PRESSURE DRESSING FOR WOUNDS

Richard S. Carlisle, Beachwood Ln., Box 307, Rye, N.Y. 10580

Continuation-in-part of Ser. No. 877,823, Nov. 18, 1969, abandoned. This application Nov. 17, 1971, Ser. No. 199,759

Int. Cl. A61l *15/00*

U.S. Cl. 128—156 **18 Claims**



A non- woven dressing is provided for human (or animal) body lesions which has a high rate of absorbency irrespective

of gravity for water and blood, is non-compressible relative to prior art dressings to the extent that pressure generated by strips of retaining material is effectively transmitted to the wound surface, is substantially non-elastic, so that said transmitted pressure is distributed evenly when the dressing is affixed to a surface which is curved, and the material is relatively dense, to the extent that the absorbed exudates become so thinly dispersed that their adhesive effect is reduced sufficiently within the dressing material to allow layers of said material to be readily separated one from another at any time.

3,824,997

MANUFACTURE OF ALGINIC MATERIAL

Kenneth John Franklin, Harrow, and Keith Bates, Pinner, both of England, assignors to Medical Alginates Limited, Perivale, Middlesex, England

Filed Nov. 29, 1971, Ser. No. 203,039

Claims priority, application Great Britain, Aug. 12, 1971, 38010/71

Int. Cl. A61l *15/04*

U.S. Cl. 128—156 **3 Claims**

Partially soluble alginic material in the form of gauze or wool, suitable for the preparation of surgical dressings, based on alginic acid and containing calcium, sodium and acid forms e.g. in the ratio 4 : 5 : 1 and characterised by a calcium content of 2 to 6 percent and a reaction pH of 4 to 7 and a method of manufacture by treatment of the insoluble calcium form of the material with a predetermined quantity of acid and, thereafter, alcoholic alkali.

3,824,998

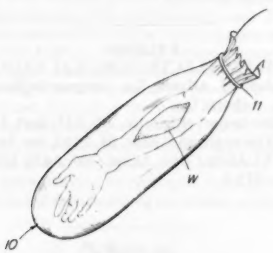
FIRST AID DRESSING FOR WOUNDS OR BURNS

George W. Snyder, Hudson, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Oct. 12, 1971, Ser. No. 188,317

Int. Cl. A61f *13/00*

U.S. Cl. 128—157 **11 Claims**



A first aid dressing for wounds or burns to prevent gross infection of the burns or wounds from air or water-borne bacteria, dust, dirt, etc. which comprises a microporous breathable thermoplastic film of sufficient size to cover the burn or wound and preferably an uninjured perimeter around the burn or wound and means around the perimeter of the microporous film, such means being able to provide a closure of the microporous film dressing to the perimeter around the burn or wound, the closure being sufficiently secure to prevent gross entry of air between the dressing and the skin. In use, when so applied, the first aid dressing, which is usually non-adherent to the wound or burn, is inflated away from the wound or burn by means of positive pressure created by moisture vapor issuing from the burn or wound or the uninjured parts of the body which are covered by the first aid dressing or entrapped air heated by the skin. The first aid dressing is permeable to air and moisture vapor, but impermeable to liquid water and other liquids which do not wet the hydrophobic film and also to air-or water-borne bacteria, etc.

3,824,999

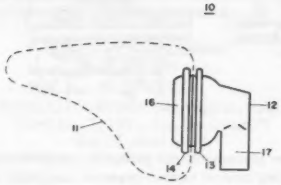
TRACHEOTOMY MASK

William R. King, Denver, Colo., assignor to Sandoz-Wander, Inc., Hanover, N.J.

Continuation-in-part of Ser. No. 289,823, Sept. 18, 1972, which is a continuation-in-part of Ser. No. 152,358, June 11, 1971, abandoned. This application Apr. 11, 1973, Ser. No. 349,978

Int. Cl. A61m *15/00*

U.S. Cl. 128—185 **27 Claims**



A tracheotomy mask having a tubing adapter with a ball joint socket, for improved rotatability of the adapter with respect to the mask.

3,825,000

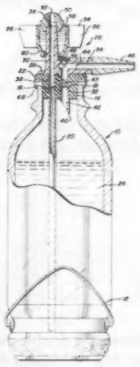
DISPOSABLE HUMIDIFIER

James A. Huggins, Libertyville, Ill., assignor to Baxter Laboratories, Inc., Libertyville, Ill.

Filed Nov. 8, 1972, Ser. No. 304,757

Int. Cl. A61m *15/00*

U.S. Cl. 128—194 **11 Claims**

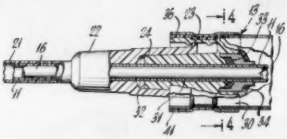


Oxygen to be administered to a patient is humidified by passing the oxygen through a standard water-containing intravenous solution bottle. A coupling assembly having an inlet tube and an outlet tube is inserted into the two openings defined by the stopper of the intravenous solution bottle, and is coupled to an oxygen supply. The connector assembly is capable of supporting the bottle, and carries a humidified oxygen outlet to which a nasal cannula is coupled.

3,825,001
CATHETER PLACEMENT UNIT

Stanford M. Bennet, Milltown; William Smith, Califon, and Joseph J. Thomas, Somerville, all of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Dec. 5, 1972, Ser. No. 312,426
Int. Cl. A61m *25/02*
U.S. Cl. 128—214.4 **5 Claims**

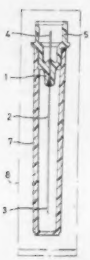


A catheter placement unit primarily useful with equipment for monitoring central venous pressure comprises a length of flexible hollow tubing having a female fitting at one end for attachment to the equipment and a male fitting adjacent the other end for attachment to the hub of a flexible intravenous plastic catheter that has been introduced into the vein of a patient. The male fitting has an axial opening through which the tubing passes and across the opening is positioned an elastomeric diaphragm having a slit which tightly engages the outer periphery of the tubing to form a seal between the male fitting and the tubing and to yieldingly resist the movement of the tubing relative to the male fitting. A stylet is preferably provided within the lumen of the tubing and a flexible plastic sheath preferably covers the tubing to provide a sterile procedure for feeding the tubing through the male fitting and plastic catheter.

3,825,002
CARTRIDGE SYRINGE AND CRIMPED NEEDLE ASSEMBLY

Anthony Thomas Paige, Cranleigh, England, assignor to The Amalgamated Dental Company Limited, London, England

Filed Feb. 7, 1972, Ser. No. 224,064
Int. Cl. A61m *5/24*
U.S. Cl. 128—218 DA **5 Claims**

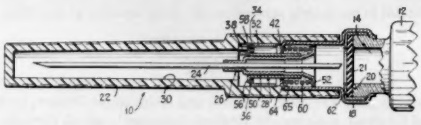


The invention provides a double-ended hypodermic injection needle comprising a double-ended cannula having mounted along the length thereof holding means comprising a body part engaging therewith and dividing it into two parts, namely an injection part and a cartridge part, the body member being provided with a skirt extending around the cartridge-piercing part of the cannula and at least a part of the outer surface of the skirt being provided with suitably longitudinally extending ribs, for engaging an internal screw thread in the body of a syringe in screw-thread relationship. The rim of the skirt preferably extends beyond the end of the cartridge-piercing part of the cannula and the injection part of the cannula may be protected by an elongated cap.

3,825,003
SEALED-HYPODERMIC SYRINGE

Ralph E. Kruck, Waterbury, Conn., assignor to VCA Metal Fabrications, Inc., Waterbury, Conn.

Filed Dec. 26, 1972, Ser. No. 318,576
Int. Cl. A61m *5/32*
U.S. Cl. 128—218 NV **8 Claims**

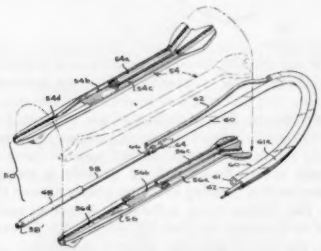


A sealed hypodermic syringe comprising a cylindrical syringe body having a discharge opening at one end with a sealing membrane extending across the opening. A ferrule is disposed on the syringe body adjacent the discharge opening, the ferrule carrying a double-pointed needle and hub assembly arranged for longitudinal movement between an advanced position wherein the inner end of the needle is spaced from the sealing membrane, and a retracted position wherein the inner end pierces the membrane and communicates with fluid contained within the syringe body. A spring biases the needle to its retracted position, and a cover having a hollow bore houses the protruding portion of the needle. Press-fitted into the bore of the cover is an insert ring having locking shoulders which cooperate with ears of the needle-hub assembly to retain the needle in its advanced position against the action of the spring prior to the first use of the syringe. To ready the syringe for use the cover is turned slightly. This releases the advanced needle whereupon the action of the spring instantly snaps it to the retracted position, The inner end of the needle thereby pierces the sealing membrane and communicates with the syringe chamber, enabling discharge therefrom to be effected. Once the cover has been removed and the needle has snapped to its retracted, operative position, the cover can no longer be replaced and retained to house the needle. Thus, prior use of the syringe will be indicated.

3,825,004
DISPOSABLE ELECTROSURGICAL CAUTERY

John G. Durden, III, Atlanta, Ga., assignor to Durden Enterprises, Ltd., Auburn, Ga.

Continuation-in-part of Ser. No. 288,543, Sept. 13, 1972, abandoned. This application Mar. 19, 1973, Ser. No. 342,382
Int. Cl. A61b *17/36;* **A61m** *1/00;* **A61n** *3/06*
U.S. Cl. 128—275.1 **25 Claims**



A disposable electrosurgical cautery which functions in a dual capacity as a hollow sucker tube as well as a cauterizer, and is intended to be prepackaged in sterilized containers to be used once and disposed of. The cautery consists of an elongated metal electrode tube having an electrical conductor wire permanently connected to a prelimal portion, and

together are encased in a plastic housing which serves as an insulating handle. The handle is of special sculptured or contoured configuration to provide for deft and positive use of the distally projecting probe or point of the cautery without chance of short circuits or burns through inadequate wire connections or poor insulation. In operation, blood from a surgical incision or other wound is drawn by vacuum through the barrel of the electrode tube, clear of the severed vessels, and a high frequency current is passed through the electrode to cauterize and prevent further bleeding of the vessels.

3,825,005

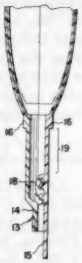
RESEALABLE CLOSURE FOR ILEOSTOMY BAG

Leonard Fenton, Beachwood, Ohio, assignor to Marlen Manufacturing and Development Co., Bedford, Ohio

Filed Feb. 26, 1973, Ser. No. 335,949

Int. Cl. A61f *5/44*

U.S. Cl. 128—283 **12 Claims**



A reusable, resealable, ileostomy or colostomy bag which may be emptied without removing the bag from the stoma of the user. Overlapping flexible panels of plastic material, which are sealingly connected at their sides, are sealed to the walls of the bag or pouch. Ribs integral with one panel are adapted to sealingly fit into channels formed by ribs on the other panel to provide a gas-impermeable and fluid-tight seal. The resilience of the panels permits them to be bent together along the line of sealing at the bottom of the bag. Finger pressure, oppositely directed along the closure, permits distension of the closure to its full opening, permitting fecal matter in the pouch to be dumped without contacting the same. To more securely seal the bottom of such a bag, a secondary sealing device is provided. Such a sealing device comprises mating sealing members on either side of a fold line at the bottom of the bag. The secondary seal is effected by folding the bottom of the bag one or more times and then fastening the mating sealing members.

3,825,006

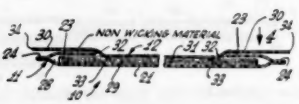
DIAPER GARMENT WITH INTERLEAVED LINER HAVING NON-WICKING PROTECTIVE PANELS

Harold J. Ralph, 1534 E. Edinger St., Santa Ana, Calif. 92705

Continuation-in-part of Ser. No. 214,974, Jan. 8, 1972, Pat. No. 3,771,524, which is a continuation-in-part of Ser. No. 74,013, Sept. 21, 1970, Pat. No. 3,667,466. This application Nov. 5, 1973, Ser. No. 412,692

Int. Cl. A41b *13/02*

U.S. Cl. 128—287 **9 Claims**



A moisture-impervious snap-on retainer comprising a generally rectangular main body panel with side and end flaps on one side defining a reservoir, and an absorbent liner comprising a rectangular pad underlying said flaps, and protective panels joined to the pad between said side flaps and overlying the side flaps, both to minimize contact with the wearer and to frictionally hold the liner against slipping relative to the retainer. The protective panels are composed of non-wicking or hydrophobic material which will not conduct liquid laterally across the side flaps from the pad, and thus remain dry, being protected from direct exposure to the pad by the impervious side flaps. In one embodiment, the protective panels are the opposite edge portions of a single sheet glued to the pad between the side flaps, and in another embodiment, they are separate strips similarly glued to the pad.

3,825,007

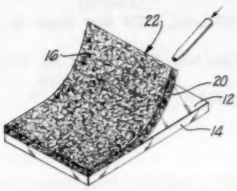
PLEDGETS

Robert W. Rand, 521 N. Bristol, Los Angeles, Calif. 90049

Filed Jan. 7, 1972, Ser. No. 216,077

Int. Cl. A61f *13/00*

U.S. Cl. 128—296 **2 Claims**



A "pledget" is disclosed which comprises a piece of an absorbent, fiberous material having a surface covered by a covering of a flexible, resilient polymer material which extends over and around and into the interstices of the fibers at the surface of the piece of material. Such a structure can be created by contacting the surface with a layer of a latex of the polymer material for a sufficient period so that the liquid vehicle within the latex will be absorbed into the fiberous material, resulting in the formation of the covering on the fibers at the surface of the material, and then removing the liquid vehicle from the material and from the covering.

3,825,008

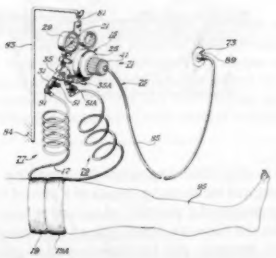
APPARATUS FOR CONTROLLING FLOW OF BLOOD

Russel W. Shook, 521 Brookside Ter., Oklahoma City, Okla. 73137

Continuation-in-part of Ser. No. 163,963, June 19, 1971, abandoned. This application Feb. 16, 1973, Ser. No. 333,399

Int. Cl. A61b *17/12*

U.S. Cl. 128—327 **9 Claims**



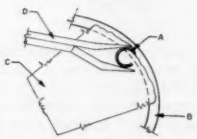
A combination, including pressure regulating apparatus, for controlling the flow of blood in a limb of a patient characterized by a container of a biologically inert gas such as carbon

dioxide at a pressure no more than 1,000 pounds per square inch gauge (psig), a pressure regulator means that provides a set downstream pressure without variation even under zero flow conditions and having a convenient means for altering the set downstream pressure, a gauge that reads in both psig and millimeters of mercury for medical use, a pressure relief means for relieving the downstream pressure back to atmospheric pressure, an inflatable tourniquet, and the requisite interconnections. Also disclosed are preferred embodiments; including a Beir block combination having a plurality of inflatable tourniquets for anesthetizing locally; and respective branches connecting with the pressure regulating apparatus, each branch incorporating a toggle valve means for allowing alternate and inverse tourniquet inflation and deflation with immediately responsive operation of the respective inflatable tourniquet in accordance with a doctor's orders without having to alter the setting on the pressure regulator means; as well as other specific structural and advantageous features.

3,825,009
METHOD OF SURGICALLY REPAIRING DAMAGED EAR DRUMS

John David Williams, 372W Star Route A, Anchorage, Ala. 99507

Filed Mar. 19, 1973, Ser. No. 325,245
Int. Cl. A61b *17/04*
U.S. Cl. 128—334 R **1 Claim**

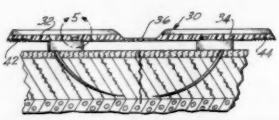


A method of fabrication and application of a small metallic clip which is utilized to attach tympanoplastic material securely into position during ear surgery is described.

3,825,010
SURGICAL APPARATUS FOR CLOSING WOUNDS

Bernard McDonald, 18212 Pacific Coast Hwy., Malibu, Calif. 90265

Filed Apr. 23, 1973, Ser. No. 353,229
Int. Cl. A61b *17/08*; **A61m** *5/32*
U.S. Cl. 128—337 **9 Claims**

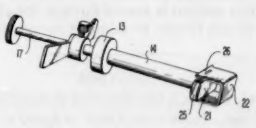


There is described apparatus for repairing lacerations or closing surgical incisions by means of a pair of carrier strips on which are mounted a plurality of curved stylets that can be inserted into the tissue on either side of the wound. A combined applicator, fastener, and bandage is used to grip a strip during insertion of the stylets into the tissue and then used as a strap connecting the two strips together to draw the carrier strips together on either side of the wound, so as to close the wound and at the same time act as a dressing for covering the wound.

3,825,011
ARTERY CLAMP

Werner Frewer, Rt. 1, Box No. 353-B, Earlysville, Va. 22936

Filed Jan. 26, 1973, Ser. No. 327,111
Int. Cl. A61b *17/12*
U.S. Cl. 128—346 **2 Claims**

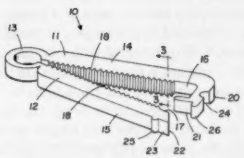


An artery clamp useful in the treatment of intracranial aneurysms and other vascular disorders of the type described in U.S. Pat. No. 3,631,859 and which includes a yoke member having limbs thereof in releasable engagement with a plate, a pressure plate mounted for reciprocation between and orthogonal to the limbs of the yoke member, with the improvement herein involving the flaring of the terminal portions of the limbs of the yoke to facilitate assembly thereof with the plate as well as the inclusion of flanges on the pressure plate to prevent rotation thereof relative to the yoke member.

3,825,012
REUSABLE UMBILICAL CORD CLAMP FOR VETERINARY USE

Howard C. Nicoll, 5th & Pine Sts., Riceville, Iowa 50466

Filed Apr. 13, 1973, Ser. No. 350,951
Int. Cl. A61b *17/30*
U.S. Cl. 128—346 **3 Claims**

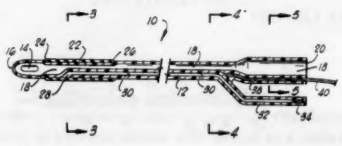


An integrally molded, plastic umbilical cord clamp for veterinary use is provided with a novel latch structure at the free ends of the jaws so that the clamp can be more readily applied and then later removed and reused.

3,825,013
BALLOON CATHETER

William J. Craven, El Reno, Okla., assignor to MCM Hospital Supplies, Inc., El Reno, Okla.

Filed Mar. 12, 1973, Ser. No. 340,041
Int. Cl. A61m *25/00*
U.S. Cl. 128—349 B **5 Claims**



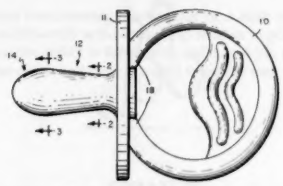
This invention relates to an improved balloon catheter of the type including an elongated flexible tubular member hav-

ing a drainage lumen formed therein. An inflatable balloon member is attached to the tubular member at its distal end and a passage is formed in the tubular member for inflating and deflating the balloon member from the proximal end of the tubular member. A second passage is provided with a removable plug disposed therein communicating the interior of the balloon member with the proximal end of the tubular member so that deflation of the balloon member can be positively indicated and accomplished by way of the second passage.

3,825,014
PACIFIER

Charles David Wroten, Shelburne, Vt., assignor to The Reddy Company, Inc., Montpelier, Vt.

Filed Aug. 21, 1972, Ser. No. 282,542
Int. Cl. A61j *17/00*
U.S. Cl. 128—360 **5 Claims**

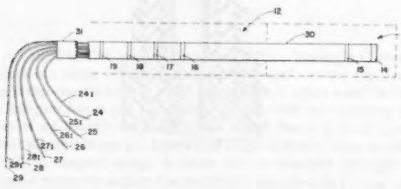


A one piece, injection molded pacifier made of a flexible plastic material comprising a lip guard and a hollow imperforate nipple which is of reduced diameter in a locality towards the lip guard and gradually increases in diameter to a substantially semispherical portion which forms the end of the nipple, the interior wall of the nipple being formed with a plurality of inwardly directed elongate ribs which extend from a locality adjacent to the portion of the nipple which is of reduced diameter to a locality which is adjacent to the substantially semispherical end portion. In a preferred embodiment each of the ribs gradually increases in height from its end which is adjacent to the portion of the nipple which is of reduced diameter as it extends towards its other end, the inner end of each rib is substantially flat and pairs of the ribs are positioned opposite to each other.

3,825,015
SINGLE CATHETER FOR ATRIAL AND VENTRICULAR STIMULATION

Barough V. Berkovits, Newton Highlands, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Dec. 14, 1972, Ser. No. 315,252
Int. Cl. A61n *1/34*
U.S. Cl. 128—404 **3 Claims**

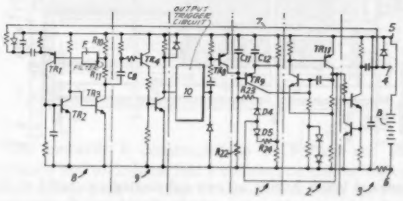


A single catheter for atrial and ventricular stimulation. A single catheter is disclosed that provides separate electrical stimulation to the atrium and separate electrical stimulation to the ventricle on mutually insulated conductors. All conductors are encapsulated in the single catheter and electrical interference between the atrial and ventricular conductors is eliminated through the use of electro-static shielding. The catheter provides two or more mutually insulated electrical conductors for stimulating the atrium. The best electrical contact made between the atrial conductors and the atrium may be measured and selected for use.

3,825,016
IMPLANTABLE CARDIAC PACEMAKER WITH BATTERY VOLTAGE-RESPONSIVE RATE

Peter Gilbert Lale, Harpenden, and Denis John Becker, St. Albans, both of England, assignors to Devices Limited, Welwyn Garden City, England

Filed Feb. 28, 1972, Ser. No. 229,687
Int. Cl. A61n *1/36*
U.S. Cl. 128—419 P **4 Claims**

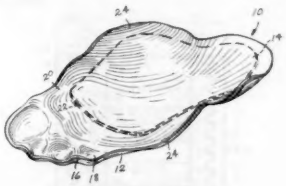


An implantable cardiac pacer including a voltage level detector for responding when the voltage of the pacer power source falls below a predetermined level. Response of the voltage detector gives a warning to the wearer in the form of increased pulse output rate.

3,825,017
FOOT CONFORMING INSOLE FOR A SHOE

Joseph E. Scrima, 3595 Arlington, St. Joseph, Mich. 49085

Filed Jan. 31, 1973, Ser. No. 328,321
Int. Cl. A61f *5/14*
U.S. Cl. 128—622 **5 Claims**



A foot conforming shoe insole which includes upper and lower layers of resilient foam material and an intermediate layer of solid material bonded between the upper and lower layers. Upturned tabs are formed by the layers on opposite sides of the insole for cradling the foot at the medial and lateral sides of the foot where the arch thereof is located.

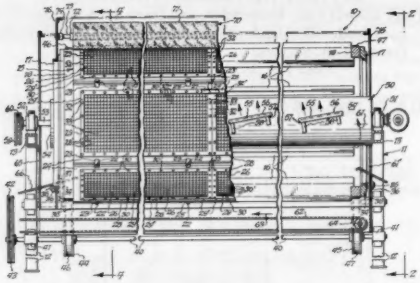
3,825,018
VINER

Dominic Ferraro, Walla Walla, Wash., assignor to Chisholm-Ryder Company, Inc., Niagara Falls, N.Y.

Filed Nov. 22, 1972, Ser. No. 308,675
Int. Cl. A01f *12/44*
U.S. Cl. 130—30 H **12 Claims**

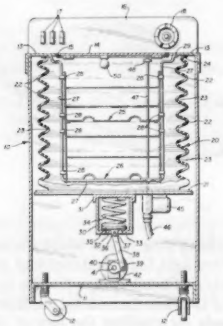
A viner for separating a crop, such as peas, from the remainder of the plant including the vines and the pods com-

prising a frame, an elongated generally cylindrical hollow reel having a surface with apertures therein for permitting said crop to pass therethrough while retaining debris consisting of the remainder of said plant within said reel, means for mounting said reel for rotation about a generally horizontal axis, beater means within said reel for separating said crop from said remainder of said plant, and a reel cleaner for removing said debris from engagement with the inside of the surface of the reel, said reel cleaner including an elongated substantially



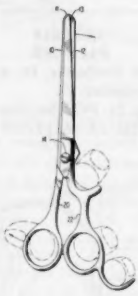
cylindrical brush having an axis substantially parallel to the axis of said reel and located outside of said reel, flexible bristles on said brush extending toward said surface of said reel and being of a length to penetrate said apertures an amount necessary to force debris away from obstructing relationship with said apertures, and bearings for journalling said brush for idle rotation which is effected by the ends of said bristles being in intermeshing contact with said apertures in the surface of said reel.

3,825,019
PRESSURE TYPE DISH WASHER
Russell J. Hall, 1530 Krameria St., Denver, Colo. 80220
Filed May 23, 1973, Ser. No. 363,086
Int. Cl. B08b *3/04*
U.S. Cl. 134—117 **4 Claims**



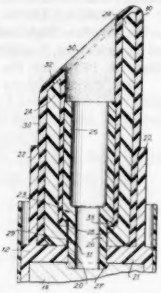
A pressure type dish washer comprising a housing having a flexible side walled reservoir in the housing, said side walls being compressible and expandable and fastened to a rigid bottom and to the top of the housing. Dish racks are supported in a frame mounted on and depending from the housing top. The reservoir side walls are alternately compressed and expanded by means in the housing bearing on the bottom of the reservoir to intermittently pressurize the washing fluid in the reservoir. Air is permitted to enter or escape from the reservoir in response to alternate compression and expansion of the reservoir side walls.

3,825,020
METHOD OF CUTTING HAIR
Thomas Elmar Myers, 7601 Silverado Trl., Napa, Calif. 94558
Filed Jan. 19, 1972, Ser. No. 218,998
Int. Cl. B26b *13/12*
U.S. Cl. 132—7 **1 Claim**



Scissors or shears for cutting hair and especially for grooming dogs or other animals are provided with a comfortable yet positive grip which allows greater facility and control in manipulation and lessens fatigue upon prolonged use. The grip is adjusted to suit the fingers of the user.

3,825,021
COSMETIC APPLICATOR
David Seidler, Forest Hills, N.Y., assignor to Applicator Brush Company, Inc., Inwood, N.Y.
Filed May 7, 1973, Ser. No. 357,734
Int. Cl. A45d *40/26*
U.S. Cl. 132—88.7 **9 Claims**



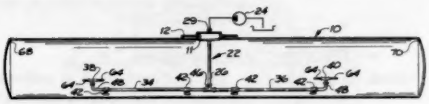
A cosmetic applicator includes a tip assembly for dispensing and applying cosmetic material stored within the applicator. The applicator tip assembly is formed of a porous conduit member in fluid communication with a cosmetic reservoir and is adapted to evenly supply the cosmetic for application to a human surface.

3,825,022

SELF-CLEANING TANK WASHER

Noble C. Metz, 95 Juniper Hill Rd., N.E., Albuquerque, N. Mex. 87122

Filed Apr. 30, 1973, Ser. No. 355,910
Int. Cl. B08b 9/08
U.S. Cl. 134—104 14 Claims



Structure for cleaning the interior of a milk transport tank which is sufficiently self-cleaning to remain in place inside the tank when the latter is filled with milk, and yet which is configured for quick and easy removal from the tank interior.

ERRATUM

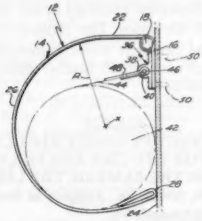
For Class 134—117 see:
Patent No. 3,825,019

3,825,023

TRAILER AWNING STRAP

Joseph S. Bergeron, 28 Morris St., West Warwick, R.I. 02893

Filed May 30, 1972, Ser. No. 257,552
Int. Cl. E04f 10/00
U.S. Cl. 135—5 AT 8 Claims



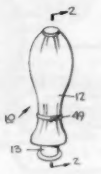
A rolled trailer awning retaining device having a C-shaped aluminum strap which is substantially rigid. At the top end of the strap the metal has been looped back upon itself to form an integral hinge pin bore which mates with the cutaway section of an aluminum hinge plate which has a pair of spaced apart aligned hinge pin bores that align with the hinge pin bore of the C-shaped strap. A brass pin is inserted through the aligned bores to secure the members together in pivotal relationship. Adjacent the hinge pin bore on the C-shaped strap is a substantially flat portion. Between this flat surface portion and the lower tip of the strap the strap member is substantially circular in cross section with the area encompassed by this portion receiving the rolled awning which rests thereon. The tip of the strap has a curved surface which has been formed by folding the metal back upon itself.

3,825,024

UMBRELLA OF MANUALLY COLLAPSIBLE CONSTRUCTION

Paul J. Cohen, 1655 Flatbush, Apt. B908, Brooklyn, N.Y. 11201

Continuation-in-part of Ser. No. 132,784, April 9, 1972, Pat. No. 3,683,948. This application Aug. 14, 1972, Ser. No. 280,150
Int. Cl. A45b 19/00, 25/02
U.S. Cl. 135—20 R 12 Claims



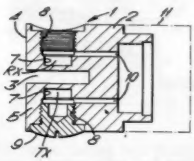
The umbrella is constructed to be opened and closed manually and to collapse into a compact condition. Tapes are used to form both the shaft of the umbrella and the ribs for spreading out the cover. In the collapsed condition, the tapes are coiled up in the handle.

3,825,025

TRANSDUCER DEVICES AND APPARATUS INCLUDING SUCH DEVICES

Duncan Roy Samuel, and Donald Fergus Moore, both of Cardiff, Wales, assignors to Radun Controls Limited, Pontypridd, Glamorgan, Wales

Filed July 6, 1972, Ser. No. 269,366
Claims priority, application Great Britain, July 9, 1971, 32422/71
Int. Cl. F16k 21/18; G01f 23/28
U.S. Cl. 137—392 6 Claims

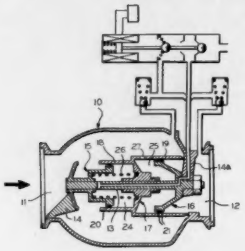


The invention provides a liquid sensing transducer comprising two spaced apart piezo-electric elements. An oscillator imparts ultrasonic vibrations to one element. The second element responds to these vibrations in dependence on the amount of liquid between the elements. The invention includes level gauge including the transducer, means for lifting and lowering the transducer, and control means for said last mentioned means responsive to the signal from the transducer to effect movement of the transducer to bring said signal to a value indicative of the presence of a given amount of liquid in said gap. The transducer can also, according to the invention, be made to control the level of liquid in a container. A number of transducers can be arranged one above the other to give on-off liquid level indication.

3,825,026
INLINE VALVE

Paul G. Salerno, Glenview; John Sikorcin, Elmhurst, and Richard Wm. Piecuch, Morton Grove, all of Ill., assignors to Vapor Corporation, Chicago, Ill.

Filed June 1, 1973, Ser. No. 366,259
Int. Cl. F16k *31/42*
U.S. Cl. 137—219 **2 Claims**

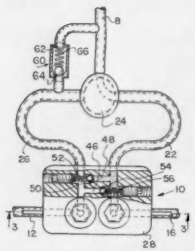


A valve for inline duct work including a pilot valve for controlling operation of the valve, together with pilot circuitry which enables the valve to be closed on command in the event of a duct pressure reversal.

3,825,027
AUTOMATIC MULTIPLE FUEL TANK CONTROL VALVE

Jack A. Henderson, 16208 Laurel Ridge Dr., Laurel, Md. 20810

Filed June 11, 1973, Ser. No. 368,832
Int. Cl. F16k *31/22, 15/18*
U.S. Cl. 137—265 **11 Claims**

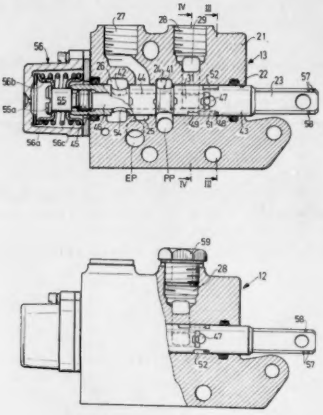


A float controlled fuel tank control valve assembly is provided for automatically supplying fuel to an engine from one of several fuel tanks connected to the engine through a tank selector valve when the fuel in the selected tank is exhausted. The float controlled valve has a separate chamber containing a ball type float valve for each fuel tank in the fuel supply system. Fuel outlet passages communicating with a fuel pump open into the bottom of each chamber, with the fuel inlet passage from each fuel tank communicating with its corresponding chamber at a level above the outlet opening. A valve seat is provided in each chamber between the inlet and outlet openings for the float valve, so that the float valve will act to block the outlet passage when the fuel in the corresponding tank and chamber is exhausted. Spring biased one-way valves interconnecting the outlet passages are provided to permit the fuel from the tank containing fuel to be supplied to the tank selector valve or by-passed around the tank selector valve and supplied directly to the fuel pump.

3,825,028
CONVERTIBLE DIRECTIONAL CONTROL VALVE

Walter Herrmann, Vaihingen/Enz, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 18, 1973, Ser. No. 409,272
Claims priority, application Germany, Oct. 20, 1972, 2251478
Int. Cl. F16k *11/00*
U.S. Cl. 137—270 **14 Claims**

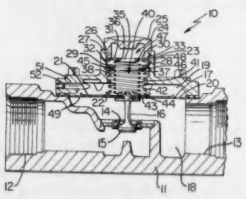


A sliding-spool directional control valve which can be converted from a four-way into a two-way valve by rotating the spool through 180° and by sealing one of two consumer ports in the body of the valve. The body has two channels which communicate with an axial bore for the spool and form part of a control line which can connect the pressure line with the return line in one operative position of the spool when the valve is used as a two-way valve and in the neutral position of the spool irrespective of whether the valve is used as a two-way or as a four-way valve. To this end, the spool has two grooves which are located diametrically opposite each other and respectively connect the channels in the first and second angular positions of the spool. The cross-sectional areas of those portions of the channels which communicate with the axial bore of the body are much smaller than the cross-sectional area of the axial bore.

3,825,029
PLURAL RANGE PRESSURE REGULATOR CONSTRUCTION OR THE LIKE AND THE METHOD OF MAKING THE SAME OR THE LIKE

Francis S. Genbauffe, Irwin, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jan. 2, 1973, Ser. No. 320,520
Int. Cl. F16k *31/12*
U.S. Cl. 137—271 **5 Claims**



A plural range pressure regulator construction having a housing provided with an inlet and an outlet separated by a

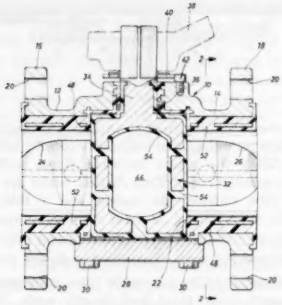
valve seat that is controlled by a valve member that is interconnected to a flexible wall carried by the housing. Biasing means are carried by the housing for acting on one side of the wall to tend to move the wall in one direction relative to the housing, the biasing means comprising a plurality of separate spring means each acting on the wall to provide one pressure range for the pressure regulator construction. The housing has a storage space for storing one of the spring means so that the same will not act on the wall whereby the remaining spring means acting on the wall will provide another pressure range for the pressure regulator construction.

3,825,030

LINED VALVES

Manmohan S. Kalsi, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Mar. 20, 1973, Ser. No. 343,090
Int. Cl. F16k *27/123, 5/02*
U.S. Cl. 137—375 **4 Claims**



A plastic lined valve structure particularly for handling corrosive ladings to protect all interior metal parts. The lining securely anchored to the valve body by a plurality of integral interlocking portions which are formed within recesses about the inner periphery of the valve body and axially extending bores communicating with the recesses. The method includes casting a plurality of radially spaced recesses along the inner circumference of inlet and outlet end sections, then drilling bores from the faces of the end sections through the cast recesses to the valve chamber, and next injecting a plastic material through the recesses and bores to provide the interlocking portions of the liner.

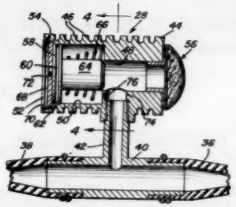
3,825,031

LINE VACUUM CONTROLLED MANIFOLD VACUUM SPOILER

James J. Dolfi, Sr., P.O. Box 434, Torrance, Calif. 90508

Continuation-in-part of Ser. No. 284,271, Aug. 8, 1972. This application Jan. 7, 1974, Ser. No. 431,484
Int. Cl. F16k *17/04*
U.S. Cl. 137—480 **9 Claims**

A valve body having an L-shaped airflow passage formed therethrough including first and second angulated end portions. One free end of one of the end portions is provided with air filtering structure and the free end of the other angulated end portion is communicated with a positive crankcase ventilation line intermediate its opposite ends. The adjacent communicating ends of the angulated end portions of the passages are disposed for free passage of air through the passage into the associated positive crankcase ventilation line. However, the valve body includes a large diameter bore formed therein including inner and outer ends with the inner end generally concentric with and opening into the smaller diameter inner end portion of the air filter equipped end portion of the passage. The outer end of the bore includes limited communication with the ambient atmosphere and a piston is slidable in the bore and includes an integral shank portion reciprocal in the air filter structure equipped angulated end portion of the passage, the piston being spring-biased toward the outer end



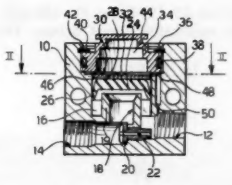
of the bore. Upon the passage through the valve body being subject to high manifold vacuum through the associated positive crankcase ventilation line the piston is shifted inwardly of the bore and the shank portion of the piston is shifted further into the air filter structure equipped end portion of the passage for variably throttling the juncture between the inner ends of the angulated end portions of the passage.

3,825,032

AUTOMATIC UNIDIRECTIONAL THROTTLE

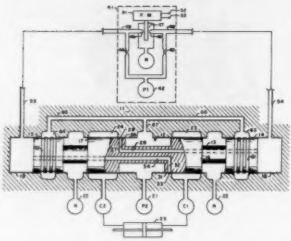
Marco Peruglia, Turin, Italy, assignor to FIAT Societa per Azioni, Turin, Italy

Filed July 28, 1972, Ser. No. 275,994
Claims priority, application Italy, Sept. 2, 1971, 69918/71
Int. Cl. F16k *15/14*
U.S. Cl. 137—496 **1 Claim**



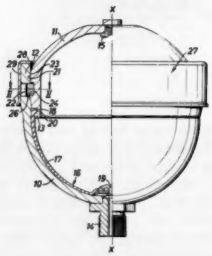
A restrictor throttle valve having two modes of operation depending on the balance of pressures therewithin. The valve has only input and output ports and allows initial free flow therebetween while the pressure in a control chamber builds up via a restrictor throttle opening which connects the control chamber with the inlet port. After the pressure in the control chamber has reached a maximum, which takes a short time after the initial application of pressure to the inlet port, any subsequent change in pressure leading to a pressure drop at the outlet port causes a valve shutter to be closed by the pressure in the control chamber. When the valve shutter is closed the inlet and outlet ports can only communicate via a restrictor throttle so that any subsequent changes in pressure must take place gradually. This is particularly useful for anti-skid braking systems where, after the initial, unobstructed, application of the brakes, any subsequent changes, during a braking operation, are due to the anti-skid device and are required to take place gradually, both for passenger comfort and for vehicle stability.

3,825,033
EXTENDED RANGE VALVE SYSTEM
Paul F. Hayner, Lexington, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.
Filed Feb. 12, 1973, Ser. No. 331,913
Int. Cl. F16k 11/07
U.S. Cl. 137—625.66 7 Claims



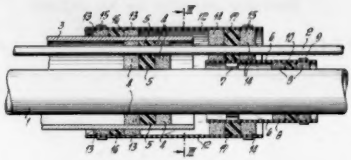
A valve system is described including a spool valve in which one face of an outboard land is in engagement with a control fluid which urges the spool in one direction in opposition to a biasing force. The other face of the land is in engagement with a fluid at a pressure much less than the pressure of the control fluid. In order to prevent the leakage of control fluid across the land to the return, the land is formed with several grooves around its cylindrical surface at least one of which is always in communication with a recess formed in the valve housing; this recess is connected to a source of fluid at a pressure substantially equal to that of the control fluid, thereby eliminating the tendency of the control fluid to leak across the land.

3,825,034
ACCUMULATORS
Leslie Cyril Chouings, Leamington Spa, England, assignor to Automotive Products Company Limited, Leamington Spa, England
Filed Oct. 13, 1971, Ser. No. 188,852
Claims priority, application Great Britain, Oct. 16, 1970, 49290/70
Int. Cl. F16l 55/04
U.S. Cl. 138—30 3 Claims



An accumulator for a liquid pressure system has a hollow casing comprising two hollow casing parts having mating cylindrical surfaces. There is an annular groove in each cylindrical surface, the two grooves being aligned to define an annular cavity in which is/are housed one or more inserts. The insert(s) act to hold the two hollow casing parts together. The hollow casing is assembled by inserting one of the mating cylindrical surfaces within the other to define the annular cavity, and inserting the one or more inserts through a hole in the wall portion of the outer mating casing part into the annular cavity. An annular cover maybe placed over the wall portion of the outer mating casing part when the two casing parts are assembled together, so as to cover the radially outer end of the hole.

3,825,035
SEALED-END JACKED PIPE ASSEMBLY AND METHOD OF MAKING SAME
Hellmut Butterweck, Lotharstr. 156, 4100 Duisburg, Germany
Filed June 21, 1972, Ser. No. 264,794
Claims priority, application Germany, Dec. 19, 1973, 2164037
Int. Cl. G01l 9/00
U.S. Cl. 138—109 6 Claims



An inner tube extending from the end of a protective casing is sealed by first providing two walls between the tube and the casing and filling the space between these walls with a hardenable synthetic resin. Two further walls are provided around the tube outside the casing and a thin body of synthetic-resin material, e.g., a sheet is wrapped around them and again a synthetic-resin mass is introduced into the space between these second walls. Two third walls are provided on the casing and two fourth walls on the tube, with another sheet wrapped around these third and fourth walls. Thereafter synthetic-resin material is again introduced into the space between the third walls and into the space between the fourth walls. Finally synthetic resin is poured into the chamber formed on one side by the second and fourth walls and on the other side by the first and third walls to completely seal the casing end.

3,825,036
REINFORCED PLASTICS TUBES
Vernon Denis Stent, Woking, England, assignor to Creators Limited, Surrey, England
Filed May 15, 1972, Ser. No. 253,107
Claims priority, application Great Britain, May 19, 1971, 15894/71
Int. Cl. F16l 11/08
U.S. Cl. 138—174 11 Claims

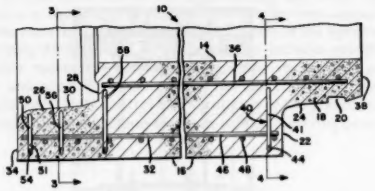
The invention is concerned with reinforced flexible plastics tubes and methods of making same. A tube of this invention has an extruded wall constituted by two different plastics materials of which one is more rigid and/or has a higher mechanical strength than the other and defines a plurality of circumferentially disposed axially extending reinforcements separated by the other plastics material and fused thereto. Tubes of this invention provide improved resistance to elongation and bursting when used for conveying fluids under pressure.

3,825,037

JACKING PIPE

Lewis R. Keyser, Dayton, Ohio, assignor to Price Brothers Company, Dayton, Ohio

Filed Apr. 5, 1972, Ser. No. 241,149
Int. Cl. F16l 9/08
U.S. Cl. 138—175 11 Claims



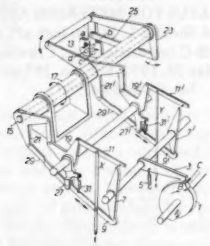
Reinforced concrete pipe especially adapted for jacking operations. To resist the shear forces generated in the bell and spigot sections of the pipe during jacking operations, radial reinforcing strands are embedded in the pipe about its entire circumference at both the bell of the pipe and the opposite end of the pipe adjacent the spigot shoulder.

3,825,038

WEFT SELECTING APPARATUS

Philip Austin Ormerod, Pontypool, England, assignor to Imperial Chemical Industries Limited, London, England

Filed June 19, 1972, Ser. No. 264,401
Int. Cl. D03d 47/38
U.S. Cl. 139—122 W 6 Claims



Weft yarn selecting apparatus for use in combination with shuttle-less looms, having a number of weft yarn positions in fixed relation to each other in which means are provided for bringing the positions to a common yarn firing point.

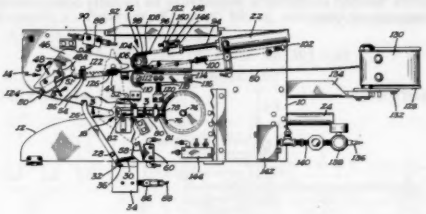
3,825,039

TWIST-TIE BAG CLOSING MACHINE

Jasper R. Crabb, Yakima, Wash., assignor to Domain Industries, Inc., New Richmond, Wis.

Filed June 5, 1972, Ser. No. 259,834
Int. Cl. B21f 7/00, 15/00
U.S. Cl. 140—93 A 5 Claims

A machine for closing the open, gathered ends of flexible bags, such as bags of paper or plastic, incorporates a plurality of air operated cylinders which serve to carry out the various functions of feeding a length of tying tape into position, cutting off the desired length of tape, driving a forming arm to



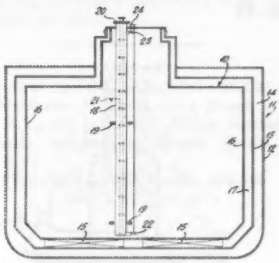
form the tape about the neck of the bag, and activating the rotating hooked twister for twisting the ends of the tying tape together.

3,825,040

TANK GAUGING SYSTEM

Richard A. Haisch, Clark, N.J., assignor to Esso Research and Engineering Company, Linden, N.J.

Filed May 10, 1972, Ser. No. 251,928
Int. Cl. B65b 3/04
U.S. Cl. 141—1 5 Claims



A tank gauging system which is capable of being repaired without having to remove the tank in which the system is contained from service. The system includes a tank gauging tube housing or stillwell which is mounted between the top and bottom of a cargo-carrying tank and which is intended primarily to house a conventional liquid level gauge or other such device. The housing serves the dual prupose of mounting the level gauge and in the event of loss of the normal cargo pumps, the gauge itself may be removed from the tube and a pump temporarily installed for pumping out the tank.

3,825,041

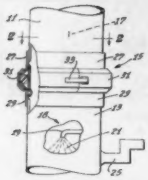
PIPE COUPLING

Robert Cornog, 4262 Wilshire Blvd., Suite 320, Redondo Beach, Calif. 90010

Filed May 22, 1972, Ser. No. 255,210
Int. Cl. B65b 3/04; B65d 53/06; F16l 19/02
U.S. Cl. 141—1 35 Claims

In a coupling for connecting first and second tubes a first sealing member is attached to the first tube, a second sealing member is attached to the second tube, and a first elastomeric means is axially compressed between the first and second sealing members. A third sealing member can be associated with the first sealing member to extend inwardly of and provide a seat for the first elastomeric means.

A recess is defined by portions of the second and third sealing members to inhibit the passage of fluids between the second and third sealing members into contact with the first means. Second elastomeric means may be radially compressed within this recess.



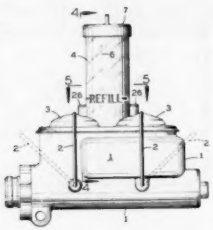
A cavity may be formed between the first elastomeric means and a particular one of the first and third sealing members. The invention includes means for detecting virtual leaks which may occur between the cavity and the interior regions of the tubes.

3,825,042

AUXILIARY RESERVOIR FOR FLUID IN A HYDRAULIC BRAKE SYSTEM

Hershey Glantz, Miami, Fla.

Filed Jan. 15, 1973, Ser. No. 323,758
Int. Cl. B65b *3/04*
U.S. Cl. 141—95 **4 Claims**



This invention automatically provides auxiliary fluid for vehicle brake systems by the provision of a reservoir for retaining one or more chambers for feeding corresponding hydraulic circuits and thus preventing accidental loss of braking power and the resulting accidents. The fluid from the reservoir is automatically fed to the brake actuating assembly by a float means and the reservoir made of transparent material to provide visual inspection for indicating refill.

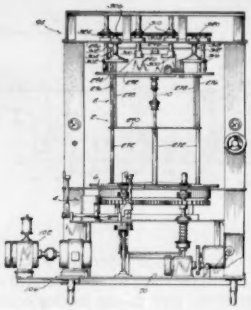
3,825,043

FILLING MACHINE FOR CONTAINERS

Paul R. Fechheimer, Worcester, Mass., assignor to A-T-O Inc., Willoughby, Ohio

Division of Ser. No. 85,442, Oct. 30, 1970, abandoned. This application Sept. 11, 1972, Ser. No. 287,660
Int. Cl. B65b *43/42*; **B67c** *3/04*
U.S. Cl. 141—147 **3 Claims**

A rotary acting filler machine for containers such as bottles includes a series of vertically reciprocable filling nozzles adapted to be moved under the control of cam means between raised, inoperative positions to a container with the lower end or tip of the nozzle above the upper end thereof and lowered, operative positions thereto with the tip of the nozzle projecting axially within the container. The upper limit of movement of the nozzles in the filler is controlled by a main plate-type cam which is vertically adjustable in the filler whereby to permit containers of varying overall heights to be accommodated for filling action in the filler without obstruction from the nozzles at the same time while permitting the nozzles to be brought rapidly into filling positions to the containers to attain maximum production output in the filler for any particular type of container.



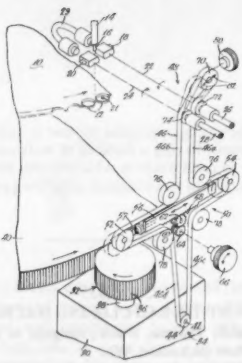
The axial penetration of the nozzles into the containers is controlled by a secondary cam means in the form of a ring which is also vertically adjustable in the filler so as to permit the axial position of the nozzles in the containers being filled in any particular operating run of the filler to be regulated in a manner as will provide a rapid, accurate filling of such containers.

3,825,044

DRIVE APPARATUS FOR METERING APPARATUS

Lyle M. Lidikay, and Sheldon L. Wilde, both of Crawfordsville, Ind., assignors to H-C Ind ustries, Inc., Crawfordsville, Ind.

Filed May 30, 1972, Ser. No. 257,862
Int. Cl. B65b *43/50*
U.S. Cl. 141—187 **16 Claims**



The disclosure relates to an apparatus for driving a metering type charge depositing apparatus that includes a conveyor advancing a plurality of open-topped receiving devices in predetermined relation along a receiving path with means

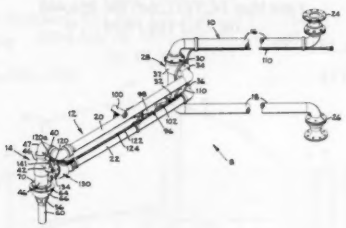
above the path for supplying a constant supply of plastic material along a vertical path toward the receiving path and cutting means for removing a predetermined amount of the constant supply for deposit into a receiving device. The apparatus for driving includes first drive means for driving the conveyor at a predetermined rate and second drive means for driving the cutter means, which includes first and second rotating cutters, at a constant rate synchronous to said predetermined rate. First adjustable means cooperates with the second drive means for coordinating the cutter means relative to the conveyor to insure that the severed amounts of plastic material are deposited in the centers of the opentopped receiving devices. The drive means also includes second adjustable means for varying the engaging relationship of the first and second cutters relative to the constant supply of plastic material to control the orientation of the plastic material when it is received into the open-topped receiving devices.

3,825,045

FLUID DELIVERY AND VAPOR RECOVERY APPARATUS

George W. Bloomquist, Long Beach, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Aug. 22, 1972, Ser. No. 282,809
Int. Cl. B67c *3/00*
U.S. Cl. 141—198 **39 Claims**



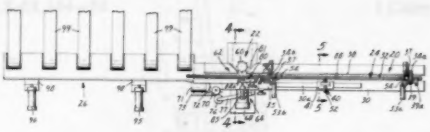
A fluid delivery and vapor recovery arm especially for dispensing gasoline or other volatile liquids and collecting their evolved vapors, having a combined fluid delivery-vapor recovery head assembly mounted on the distal end of the arm's outer boom section. The outer boom section includes vertically spaced and generally parallel conduits, one for fluid delivery and one for vapor return, interconnecting the head assembly and the arm's inner boom section through swivel joints in such manner that vertical orientation of the head assembly is ensured for any attitude of the outer boom section. The head assembly includes an annular dome seat that engages a collar to close off the lower end of a vapor return conduit until the head is seated in a container hatch. The arm will deliver fluid to a container only when the head is properly seated in the hatch, and only when the fluid in the container is below a certain level. The arm further includes a control valve assembly having a diaphragm valve that controls a fluid delivery valve operated by air pressure. A venturi-type mechanism, also considered to be an aspirator device, functions to actuate the diaphragm valve when the liquid in the container rises to a predetermined level, causing this valve to shut off air pressure to the fluid delivery valve, which delivery valve then automatically closes. A contact valve in the control valve assembly directs air pressure to the fluid delivery valve only when the dome seat is properly positioned in the hatch thus causing the delivery valve to open, and the diaphragm and contact valves cooperate in a unique manner to prevent the delivery valve from opening accidentally.

3,825,046

APPARATUS AND METHOD FOR REDUCING THE OCCURRENCE OF BOWING IN WOODEN WINDOW RAILS

Kenneth L. Peterson, Bayport, Minn., assignor to Anderson Corporation, Bayport, Minn.

Filed Oct. 26, 1972, Ser. No. 301,130
Int. Cl. B27c *5/04*
U.S. Cl. 144—142 **5 Claims**



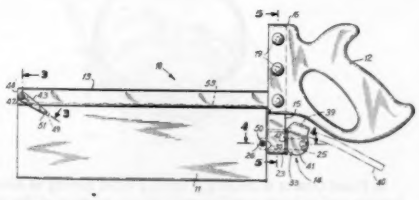
Apparatus and a method for reducing the bowing of window rail members constructed from wood by machining a curvature in the member which counteracts the naturally occurring bow. A number of rail members (e.g., a plurality of check rails) are initially stored in a hopper in a horizontally extending, vertically over-laying position. The bottom rail in the hopper is continuously discharged by a drive chain which conveys the rail to a cam-driven cutting tool for cutting a concave bow in the rail opposite the side receiving the window pane. Curvature sensing means are associated with the hopper to determine the natural curvature, if any, of each rail, thus, allowing the curvature of the rails to be aligned and the removal of any rail having too large a natural bow to be counteracted by the machined curvature.

3,825,047

HAND SAW HAVING DEMOUNTABLE BLADE

Walter K. McManus, Westfield, N.J.; Joseph T. Bouffard, Brooklyn, N.Y., and Lennard D. Harris, Scarborough, Ontario, Canada, assignors to Atlantic Service Co., Inc., Brooklyn, N.Y.

Filed Oct. 12, 1973, Ser. No. 406,036
Int. Cl. B27b *21/00*
U.S. Cl. 145—31 R **6 Claims**



A saw frame of the so-called back saw type is disclosed, including a readily replaceable saw blade, the assembly being characterized by novel and improved coupling means for securely attaching the blade to the frame, while at the same time rigidifying the blade against flexure in the plane of the blade.

3,825,048

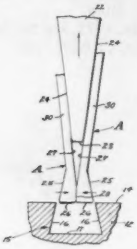
INTERLOCKING SCREW AND DRIVER

Matej K. Triska, 2265 N. Elizabeth St., Indianapolis, Ind. 46219

Filed Jan. 2, 1973, Ser. No. 320,673
Int. Cl. B25b *15/00*
U.S. Cl. 145—50 E **1 Claim**

A screw head and driving tool therefor are releasably coupled by means of a pair of radially shiftable anchors held in al-

ternate engaged and disengaged relation to a complementary screw slot by a driver blade shiftable longitudinal therebetween. The engaged anchors and complementary slot

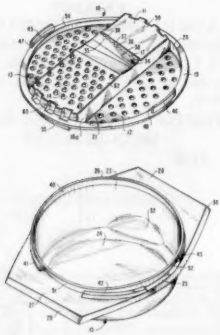


are of undercut or dovetailed cross section which prevents displacement of the driving tool from the screw head, and released when the anchors are set in the disengaged condition.

3,825,049
FOOD GRATER

James B. Swett, and Harold P. Ashton, both of Providence, R.I., assignors to Dart Industries Inc., Los Angeles, Calif.

Division of Ser. No. 102,623, Dec. 30, 1970, Pat. No. 3,698,460. This application July 13, 1972, Ser. No. 271,449
Int. Cl. B65d *37/00*
U.S. Cl. 150—.5 **3 Claims**



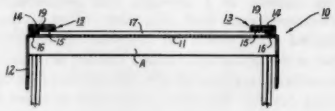
A Food Grater including a unique bowl having at least one handle and at least one flattened planar portion at the side of the bowl. The outermost extent of the handle is in the same plane as the flattened planar portion so the bowl can be held in a tilted position and rested on the outermost extent of the handle and the planar portion without rolling. The bowl is also provided with spaces to accept projections on a mating grater element so that the grater element will not rotate on the bowl when the grater is being used.

The grater element is divided into separate grating surfaces, some of which are in separate parallel planes. The separation helps prevent the fingers from being scraped on a nearby unused surface. The grater blades on some of the surfaces face in opposite directions from the grater blades on other surfaces so that a portion of the blades can be used when the grater element is in one position and the remainder can be used when the element is inverted. A unique plastic slicer is provided which has a substantially sinusoidal edge which permits the plastic slicer to be used where metal slicers were formerly required.

3,825,050
TABLE COVER

Lenora Wood Glover, 44 W. 63rd St., New York, N.Y.

Filed Nov. 8, 1972, Ser. No. 304,982
Int. Cl. A47b *97/00*
U.S. Cl. 150—52 R **2 Claims**

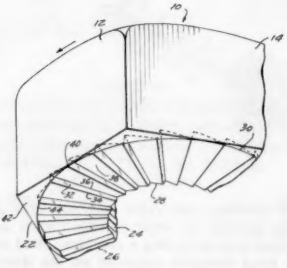


The invention embodies a table cover consisting of a sheet of non-absorbent material adapted to overlie a table and depend at its edges about the table and which is formed with a plurality of separate flaps extending peripherally about a central portion of the sheet and adapted to overlie the edge portions of the table. The flaps are disposed in close separated relation at their adjacent ends whereby the flaps may be independently raised for convenience in inserting the edge portions of an auxiliary centerpiece in covering relation with the central portion of the sheet and for cleaning out the recesses formed by the flaps and the cover.

3,825,051
SELF-LOCKING BOLT

Jerry A. Sigmund, Willow Grove, Pa., assignor to Standard Pressed Steel Co., Jenkintown, Pa.

Filed May 24, 1972, Ser. No. 256,468
Int. Cl. F16b *39/28*
U.S. Cl. 151—37 **9 Claims**



A self-locking fastener having a serrated segment within the bearing surface of the fastener arranged to penetrate a workpiece so that a resistance to loosening of the fastener from the workpiece is created. The fastener includes a polygon shaped bearing surface, such as a hex-head or 12-point bolt head or nut where the serrated segment is formed within an annular segment so that circumferentially discontinuous smooth-faced outer bearing surfaces are formed across adjacent flats of the polygon configuration.

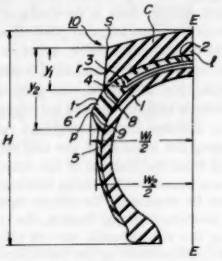
3,825,052
PNEUMATIC RUBBER TIRE FOR OFF-ROAD VEHICLES

Takashi Matsuyama; Tetsuji Tanaka, and Toshiro Tezuka, all of Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed May 15, 1973, Ser. No. 360,593
Claims priority, application Japan, Aug. 5, 1972, 47-78024
Int. Cl. B60c *13/00, 11/00*
U.S. Cl. 152—353 **8 Claims**

A pneumatic rubber tire for off-road construction vehicles, having two annular projection means which are integrally

formed with opposing sidewalls of the tire so as to extend away from tire equatorial plane. The two projection means provide protective surfaces for preventing stones and rocks from



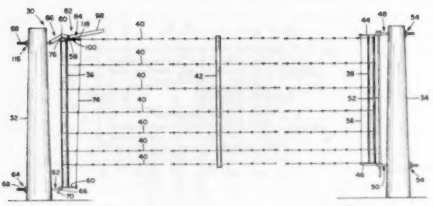
damaging the tire sidewall. The projection means are so dimensioned as to cause substantially no temperature rise in the tire by the presence thereof.

3,825,053

TRACTION GATE

Felix B. Romberg, P.O. Box 218, Holland, Tex. 75001

Filed July 10, 1972, Ser. No. 270,308
Int. Cl. E06b *3/80*
U.S. Cl. 160—328 **12 Claims**



In a traction gate, a wire barrier extends between a pair of end standards. One of the end standards is pivotally supported on a first gate post, and the lower end of the other end standard is adapted for engagement with and support by structure projecting from a second gate post. A traction mechanism is mounted on the upper end of the second gate post for engagement with pivot means on the upper end of the adjacent end standard. When not in use, the traction mechanism rests on top of the gate post and is therefore readily accessible from either side of the gate.

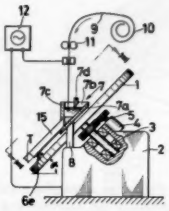
The gate is closed by engaging the traction mechanism with the pivot means and then pivoting the traction mechanism over center, whereby the gate is secured in traction by toggle action. Structure is provided for retaining the traction mechanism in the actuated position, and thereby both securing the gate in traction and locking the gate. Two embodiments of the invention are disclosed, one comprising a wire traction gate and the other comprising a laterally swinging traction gate. In the laterally swinging traction gate and end standards are secured to a longitudinal frame member which interconnects the lower ends of the end standards.

3,825,054

METHOD FOR THE MANUFACTURE OF CIRCULAR PRODUCTS

Akira Ujiie, Kobe, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 140,326, May 5, 1971, Pat. No. 3,785,429.
This application Aug. 20, 1973, Ser. No. 389,814
Claims priority, application Japan, May 18, 1970, 45-42235
Int. Cl. B22d *27/02*
U.S. Cl. 164—52 **1 Claim**



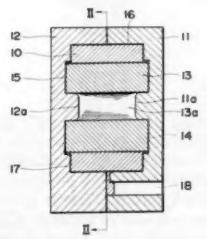
A method and an apparatus for the manufacture of circular products in which deposited metal melted by electroslag remelting process is successively drawn out of a retainer for keeping a molten slag which melts the filler metal provided at a predetermined location while being solidified and the tip thereof is fixed to a rotary table, provided in an inclined arrangement, at a position out of the center thereof and is returned into said retainer by rotating said rotary table so as to make one complete turn, thus closing a circle to form a circular product.

3,825,055

METHOD OF REMOVING CORE FROM DIECASTING

Hiroshi Mino, Hiroshima, and Satoshi Yano, Hiroshima-ken, both of Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima-ken, Japan

Filed Oct. 2, 1972, Ser. No. 294,299
Int. Cl. B22d *29/00*
U.S. Cl. 164—132 **3 Claims**

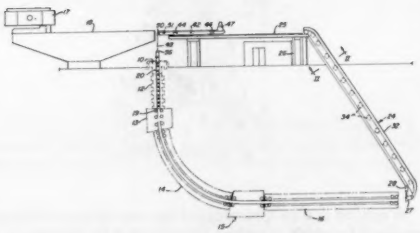


A die casting method for producing aluminum die castings each having a longitudinally extending bore which is effective to prevent the aluminum die castings from shrinking to an extent that the desired dimensions of each casting will not be achieved. To this end, an annealing process is introduced to force the casting together with a core member, which defines the bore and which is a part of the casting dies, but which is separate therefrom, to be annealed at a predetermined temperature for a predetermined time so that internal stresses previously set up in the casting can be relieved. This annealing process is carried out immediately upon solidification of the molten metal during the casting.

3,825,056
APPARATUS FOR HANDLING AND TOP-CHARGING A STARTER BAR

John A. Grosko, West Mifflin Borough, Allegheny County; Melvin G. Short, Pittsburgh, and James T. Stull, Jackson Township, Butler County, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Aug. 2, 1972, Ser. No. 277,425
Int. Cl. B22d *11/08*
U.S. Cl. 164—274 **6 Claims**

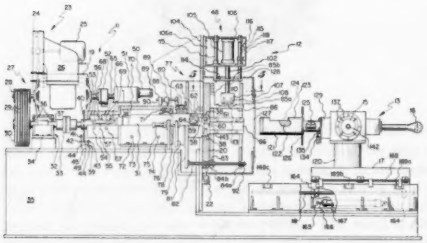


A method and apparatus for handling and top-charging a starter bar to the mold of a continuous-casting machine. The apparatus includes a recovery bridge which extends upwardly from the location where the bar is disconnected from the casting. The recovery bridge has means for propelling the bar upwardly and delivering it to a charging car, which runs on tracks above the top of the mold. The charging car has a cog wheel for propelling the bar along its length, and a reel and cable mechanism for lowering the bar into the mold.

3,825,057
HORIZONTAL CENTRIFUGAL CASTING MACHINE

Frederick William Baumann, Scotia; Bernard Ceasar Kaczkowski, Schenectady, and George Mowry Rosenberry, Jr., Elnora, William R. Smith, Ballston, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 4, 1972, Ser. No. 277,920
Int. Cl. B22d *13/10*
U.S. Cl. 164—292 **20 Claims**

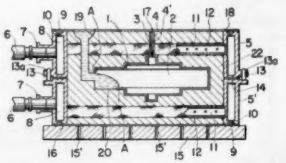


A horizontal centrifugal casting machine is described wherein a sectionalized mold for casting a cylindrical structure, e.g., a finned motor frame, is assembled, the structure cast and the mold sections stripped from the cast structure in an entirely automated process. The casting machine includes a plurality of arcuately shaped mold sections mounted upon jaws capable of being secured to pistons of pulling cylinders. With the pistons extended, the mold sections form a substantially cylindrical structure and dual annular rings having a tapered radially inner face are traversed axially along a tapered outer portion of the jaws to fixedly secure the mold sections in position. After disengagement of the pistons, the mold is rotated by a high speed drive motor whereafter a ladle containing molten metal is inserted axially within the mold and the ladle is tilted to pour the molten metal into the mold. The ladle then is withdrawn and a mandrel assembly supporting the ladle, an expandable arbor and a mold coating device is rotated to register the expandable arbor with the mold. The high speed drive motor then is de-energized and the mold stopped at a predetermined angular position using a low speed drive motor. After the expandable arbor is inserted axially within the mold and the arbor expanded to engage the interior of the cast cylindrical structure, the pistons of the pulling cylinders are driven radially inward to engage the outer surface of the jaws and the annular rings are released to permit the pistons to strip the mold from the cast structure. The cast then is removed from the interior of the stripped sections and the open jaws are coated with casting lubricant permitting the casting cycle to be repeated. To obtain optimum quality in casting finned aluminum motor frames, the rate of rotation of the ladle during the pour should vary to effect a more rapid rate of angular displacement at the initiation and termination of pouring metal from the ladle than at the middle of the pour to produce a constant flow of metal from the ladle.

3,825,058
MOLD PREPARED BY VACUUM SEALED MOLDING PROCESS

Takashi Miura; Tadashi Sugiura, both of Toyokawa, and Yoshizi Iyoda, Toyohashi, all of Japan, assignors to Sintokogio, Ltd., Nagoya, Japan

Filed Apr. 9, 1973, Ser. No. 349,471
Claims priority, application Japan, Apr. 15, 1972, 47-38068; Dec. 25, 1972, 47-2687[U]
Int. Cl. B22d *27/16*
U.S. Cl. 164—253 **4 Claims**



A mold prepared by a vacuum sealed molding process in which, in order to prevent breakdown of the mold during pouring of a molten metal, a tubular member forming a passage serving as a communication means between the mold cavity and the atmosphere is connected to the uppermost portion of a shield member defining the cavity so that the atmospheric pressure can be imparted to the cavity even when the molten metal is being poured into the cavity.

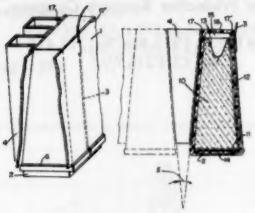
3,825,059
METHOD FOR CHARGING A HEAT STORAGE VESSEL

Nikolaus Laing, 7141 Aldingen B., Stuttgart, Germany

Division of Ser. No. 54,553, July 13, 1970, Pat. No. 3,689,738. This application June 16, 1972, Ser. No. 263,661
Int. Cl. H05b *3/00*; **F24d** *11/00*; **F24h** *7/00*
U.S. Cl. 165—1 **1 Claim**

A method of charging a heat storage vessel containing a meltable normally solid heat storage mass having a greater density in its solid state than in its liquid state includes (1) applying heat to the bottom end wall of the vessel to melt the mass and (2) concurrently applying heat to a vertical side wall of the vessel to form a thin convection passage extending

along a side of the solid storage mass from top to bottom thereof whereby there may be a flow of melted storage mass



from the region adjacent the bottom end wall through said convection passage to an expansion space in said vessel above the storage mass.

3,825,060

SYSTEM FOR FILLING AND EMPTYING OF HEAT EXCHANGERS

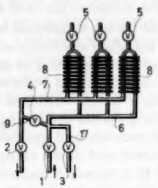
Laszlo Heller; Laszlo Forgo, and Mihaly Horvath, all of Budapest, Hungary, assignors to TRANSELEKTRO Magyar Villamossagi Kulkerskedelmi Vallalat, Budapest, Hungary

Filed Nov. 2, 1972, Ser. No. 303,166

Claims priority, application Hungary, Nov. 5, 1971, EE 1969

Int. Cl. F16f 1/34

U.S. Cl. 165—11 **5 Claims**



With outdoor erected surface heat exchangers care has to be taken of filling up and emptying in cold weather since the cooler liquid may freeze in in the heat exchanger tubes and destroy them. Thus, quick filling up and emptying is necessary.

This is obtained by employing a communication line with a regulating flap between a supply conduit connected to the inlets of the heat exchangers, and a reflux conduit connected to the outlet thereof. The communication conduit has an oblique position inclined towards the supply conduit so that the regulating flap in it will be closed only in normal operation of the system where the flap of the device is pressed down on its seat by the overpressure prevailing in the supply conduit with respect to the reflux conduit.

The advantage of the arrangement consists in that the heat exchangers can be filled up in the reverse direction and emptied through a drain conduit quickly and with simultaneous deareating and air introduction, respectively. Moreover, a relatively lesser number of component parts is required.

3,825,061

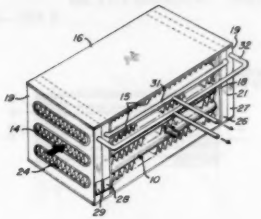
LEAK PROTECTED HEAT EXCHANGER

Pritam S. Bathla, Dayton, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Filed May 13, 1971, Ser. No. 143,027

Int. Cl. F28f 17/00, 3/00

U.S. Cl. 165—70 **5 Claims**



A fluid to fluid heat exchanger in which facial surfaces of the heat exchanger are defined by headers forming drained leak chambers in such separating relation to different flowing fluids as to obviate mixing of a leaked fluid with another fluid in the event of joint failure or the like.

3,825,062

BREATHERS FOR LIQUID OPERATED HEAT EXCHANGERS

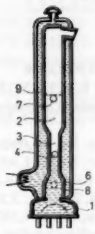
Laszlo Heller; Laszlo Forgo, and Janos Bodas, all of Budapest, Hungary, assignors to Transelektro Magyar Villamossagi Kulkereskedelmi Vallalat, Budapest, Hungary

Filed Oct. 2, 1972, Ser. No. 294,128

Claims priority, application Hungary, Oct. 5, 1971, EE 1963

Int. Cl. F28b 1/06

U.S. Cl. 165—111 **6 Claims**



Heat exchangers for recooling the cooler liquid such as cooling water of steam operated power plants have to be provided with means by which insoluble gases such as air in the cooling water may reliably be removed therefrom. Moreover, with cooling systems of power plants where the recooling of the cooling water is obtained by means of air ("air condensation"), care has to be taken that, in addition to removing insoluble gases from the cooler liquid, air may quickly enter into the heat exchangers when the latter are emptied for operational reasons whatever such as danger of frost.

This is obtained by employing a breather having an upright vent pipe which is high enough to accommodate a column of cooling water which, even in case of highest hydrostatic pressure, stays below the upper orifice of the vent pipe.

Freezing in of the water columh is prevented by a jacket surrounding the vent pipe and filled with an anti-freeze liquid.

In operation, insoluble gases may freely pass the vent pipe the cross-sectional area of which is large enough to permit suitable amounts of air to enter the heat exchanger when the latter is being emptied.

A further advantage consists in that a plurality of heat exchangers may be serviced by a single vent pipe or breather.

3,825,063

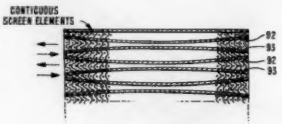
HEAT EXCHANGER AND METHOD FOR MAKING THE SAME

Kenneth W. Cowans, 3118 Patricia Ave., Los Angeles, Calif.

Division of Ser. No. 3,395, Jan. 16, 1970, abandoned. This application Mar. 13, 1972, Ser. No. 234,129

Int. Cl. F28f *13/06*

U.S. Cl. 165—146 **3 Claims**



A high effectiveness compact heat exchanger having internal passageways containing substantially transverse foraminous elements of high heat conductivity includes heat-flowed passageway walls of synthetic material that are interspersed into the interstices of the foraminous elements. Metal screens of fine mesh are contiguously stacked to provide transverse heat conduction relative to longitudinal flow paths. Internal plastic barriers transverse to and at least partially penetrating the screens define composite passageway walls providing leak free construction capable of sustaining substantial pressure differentials between adjacent passageways. The passageways are varied in cross-sectional area along their lengths, as by incremental displacements of successive barriers, to provide flow equalization for maximum efficiency.

3,825,064

HEAT EXCHANGER

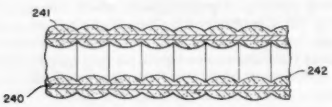
Kiyoshi Inoue, 16-8 3-Chome, Kamiyoga, Setagaya-ku, Tokyo, Japan

Continuation-in-part of Ser. No. 10,090, Feb. 16, 1970, which is a continuation of Ser. No. 611,497, Nov. 30, 1966, abandoned, which is a continuation-in-part of Ser. No. 356,714, April 2, 1964, Pat. No. 3,340,052, which is a continuation-in-part of Ser. No. 247,387, Dec. 26, 1962, Pat. No. 3,250,892. This application Oct. 12, 1971, Ser. No. 187,988

Claims priority, application Japan, Dec. 26, 1961, 36-47409

Int. Cl. F28f *1/22*

U.S. Cl. 165—179 **1 Claim**



A heat exchanger is formed by compacting metallic particles, especially of materials of high thermal conductivity to form the heat exchange surfaces, preferably against a substrate such as thermally conductive tube. The compaction involves electrical sintering, with the particle-particle interfaces and the particle-substrate interfaces metallurgically homogenized to form a monolithic structure free from corrosion sites.

3,825,065

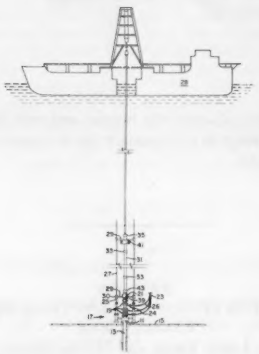
METHOD AND APPARATUS FOR DRILLING IN DEEP WATER

James R. Lloyd; Robert E. Williams; Jack H. Bayless; Gerald D. Ortloff, and George H. Bruce, all of Houston, Tex., assignors to Esso Production Research Company, Houston, Tex.

Filed Dec. 5, 1972, Ser. No. 312,415

Int. Cl. E21b *7/12*

U.S. Cl. 166—.5 **5 Claims**



The specification discloses apparatus and methods for conducting operations in an underwater well from a floating vessel without use of a riser pipe. The system includes an elongated member having a hollow longitudinal bore extending from its upper end to its lower end and sized to permit a drill string to pass therethrough. A seal means is situated near the upper end of the hollow member for sealing the drill string within its bore. This seal means is adapted to permit the drill string to rotate and to translate vertically with respect to the member. The hollow tubular member is of adequate length to permit a span of drill string to extend downward therethrough beneath said seal having a weight sufficient to overcome the differential pressure acting on the drill string as a result of the difference between well pressure and hydrostatic head. Means are provided near the lower end of the elongated member for remotely connecting it to a subsea installation provided with valve means for opening and closing the orifice of the well.

3,825,066

PROCESS FOR DEVELOPING INTERWELL COMMUNICATION IN A TAR SAND

David Arthur Redford, Fort Saskatchewan, Alberta, Canada, assignor to Petrofina Canada Ltd., Calgary, Canada

Continuation-in-part of Ser. No. 79,346, Aug. 10, 1970, Pat. No. 3,706,341. This application July 31, 1972, Ser. No. 276,732

Int. Cl. E21b *43/22, 43/24*

U.S. Cl. 166—261 **3 Claims**

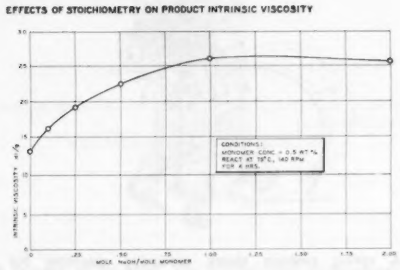
Bituminous sand is contacted with ozone to render the bitumen partly water soluble and to create surface active agents in situ which promote oil-in-water emulsification and increase the water wetability of the sand. Bitumen can then be removed and recovered from the sand formation by flushing it with an aqueous solution.

3,825,067

PREPARATION OF AQUEOUS SOLUTIONS OF POLYACRYLAMIDES SUITABLE FOR SUPPLEMENTED RECOVERY OF PETROLEUM

Charles R. Vestal, Denver, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Dec. 29, 1972, Ser. No. 319,431
Int. Cl. E21b *43/22*
U.S. Cl. 166—275 6 Claims



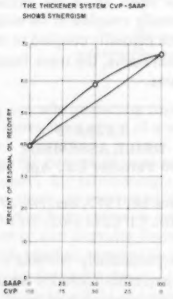
Polyacrylamide gel or polyacrylamide powder is added to water and the pH is adjusted to within the range of from about 7 to about 14, e.g., with NaOH. The mixture is then heated to from about 20° to about 100°C. to form an aqueous solution having good efficiency in the recovery of petroleum from formations.

3,825,068

CARBOXY VINYL POLYMER AND SULFONATED ALKYL ACRYLAMIDE POLYMER MOBILITY CONTROL AGENT AND PROCESS

Charles J. Norton, and David O. Falk, both of Denver, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Mar. 27, 1972, Ser. No. 238,142
Int. Cl. E21b *43/16*
U.S. Cl. 166—305 R 5 Claims



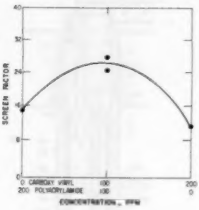
Carboxy vinyl polymer (CVP) (Carbopol 961) when dissolved with sulfonated alkyl acrylamide polymer, increases screen factor and provides enhanced supplemented recovery of oil.

3,825,069

CARBOXY VINYL POLYMER AND PARTIALLY HYDROLYZED POLYACRYLAMIDE MOBILITY CONTROL AGENT AND PROCESS

Charles J. Norton, and David O. Falk, both of Denver, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Mar. 27, 1972, Ser. No. 238,143
Int. Cl. E21b *43/16*
U.S. Cl. 166—305 R 11 Claims



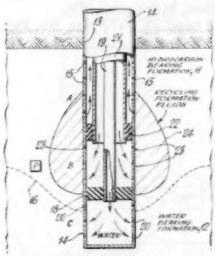
Carboxy vinyl polymer (e.g., Carbopol 961) when dissolved with partially hydrolyzed polyacrylamide (e.g., Dow 700) increases screen factor and provides enhanced supplemented recovery of oil.

3,825,070

GRADIENT BARRIER IN A SECONDARY RECOVERY OPERATION TO INHIBIT WATER CONING

Donald L. Hoyt, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 22, 1972, Ser. No. 317,845
Int. Cl. E21b *43/20*
U.S. Cl. 166—306 9 Claims



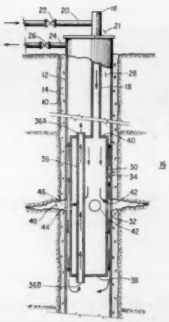
The advance of the interface between subterranean hydrocarbon bearing formation fluids containing hydrocarbons and an underlying aquifer in a secondary recovery operation as it advances toward production perforations in a well bore to result in water coning during production is delayed by the imposition of reciculating barrier of an extraneous fluid, such as produced fluid hydrocarbons, injected into the subterranean hydrocarbon bearing formation via well perforations intermediate injection (lower) and production (upper) perforations in the well bore, the recirculation of the produced fluid hydrocarbons providing a gradient barrier.

3,825,071

METHOD AND APPARATUS FOR FRACTURING OF SUBSURFACE FORMATIONS

Ralph W. Veatch, Jr., Tulsa, Okla., assignor to Amoco Production Company, Tulsa, Okla.

Filed Dec. 18, 1972, Ser. No. 316,173
Int. Cl. E21b 43/26
U.S. Cl. 166—308 6 Claims



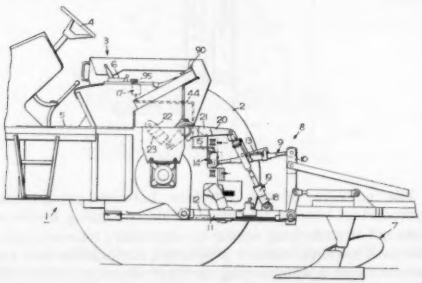
This is a system for generating a high pressure, e.g., for stimulating by injecting fluid or fracturing, at a selected vertical interval in a subsurface formation penetrated by a well bore. A cylinder member which closely fits the walls of the well bore is inserted into the well bore at the interval to be stimulated. High-pressure fluid is directed through ports in the wall thereof at the center longitudinally of the cylinder to the point of the formation to be fractured. The fluid friction loss in the annular area between the close-fitting cylinder and the bore hole wall permits the high-pressure fluid to be at fracturing or stimulation pressure only at the selected interval.

3,825,072

ELECTRONIC UPPER LINK SENSING

Eldred L. Collins, Cedar Falls, Iowa, assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sept. 28, 1972, Ser. No. 293,131
Int. Cl. A01b 63/112
U.S. Cl. 172—7 9 Claims



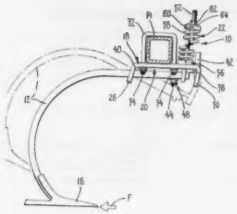
Electronic draft load sensing on the upper link of a three point hitch operating in combination with a hydraulic weight distribution system on a draft vehicle.

3,825,073

SPRING CUSHION SHANK MOUNTING ASSEMBLY

Guy F. Gardner, Dearborn, and Arnold C. Boyak, Jr., Detroit, both of Mich., assignors to Massey-Ferguson Inc., Detroit, Mich.

Filed Jan. 10, 1973, Ser. No. 322,346
Int. Cl. A01b 15/00, 35/24
U.S. Cl. 172—710 1 Claim



A spring cushion shank mounting assembly for an earthworking tool including a bed bracket, a shank support assembly, a shank, and a spring assembly. The bed bracket, which is formed from a steel plate, includes a center section attached to an implement frame, a transversely extending depending rear flange with an aperture and two spaced depending front flanges. A shank support is positioned adjacent to the center section of the bed bracket with an arcuate rear section in contact with the transversely extending depending rear flange at each side of the aperture and an elongated guide member limited to vertical movement in the slot formed by the two spaced depending front flanges. One end of a shank passes through the aperture and is connected to the shank support. The spring assembly biases the forward end of the shank and the shank support toward the bed bracket.

3,825,074

INTERACTING BULLDOZER STABILIZER AND EQUALIZER BAR

Robert N. Stedman, Chillicothe, and Robert J. Purcell, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 21, 1972, Ser. No. 317,187
Int. Cl. E02f 3/76
U.S. Cl. 172—803 8 Claims

A bulldozer has a brace between the blade and the main frame of the tractor upon which the blade is mounted. An equalizer bar is pivotally coupled at its midpoint to the main frame and has its ends pivotally coupled to the track frames on either side of the main frame, the track frames being pivotally fixed to the main frame.

3,825,075

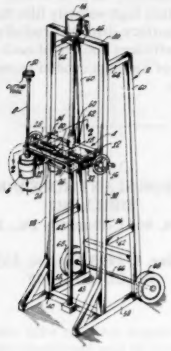
DRILL ASSEMBLY

Robert L. Mee, 3600 Paradise Rd., Apt. 94, Las Vegas, Nev. 89109

Filed June 18, 1973, Ser. No. 371,171
Int. Cl. E21c 5/02, 5/11
U.S. Cl. 173—43 9 Claims

A drill assembly particularly suitable for use in building construction. The assembly includes an upright framework supporting a vertically moveable carriage. A rotatable, first threaded rod extending transversely between two forwardly projecting, horizontal arms of the carriage carries a threaded traveling member to which is attached a forwardly projecting horizontal shaft. A drill motor connected with the forward end of the shaft may be selectively pivoted between positions in which the drill shaft is horizontal and vertical. The carriage includes support members which bear slidably against the upper

and lower surfaces of the shaft, thus providing a vertically stable support for the drill. In addition, a second threaded rod parallel to the first carries an aligned second traveling member



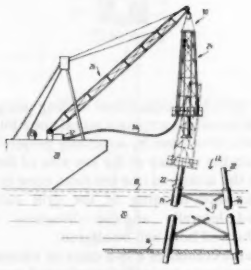
also secured to the shaft. The quadrilateral arrangement of two rods and two traveling members insures that the drill is provided with stable lateral support also.

3,825,076

PILE MOUNTED DRILLING RIG AND METHOD

Alfred Reeves Kolb, Garalston on Sea, England, assignor to Brown & Root, Inc., Houston, Tex.

Filed Feb. 9, 1973, Ser. No. 331,006
Int. Cl. E21b 7/12
U.S. Cl. 175—5 **21 Claims**



A rig for drilling in a pile projecting from a submerged surface to a location above the surface of a water body includes an elongate derrick operable to support drilling equipment and a deck fixed to the derrick at one end thereof. An elongate open ended sleeve for telescopingly receiving a pile is suspended from the deck. An apertured rig support, fixed to and generally aligned with the sleeve, is engageable with a pile received by the sleeve and provides freestanding support of the rig on the pile. A conduit communicates with the interior of the pile and projects through a sleeve aperture. The conduit provides an outlet for drilling fluid and impedes turning of the rig on the pile.

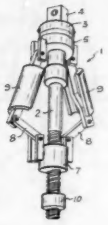
A method for drilling in piles of an offshore structure entails supporting the rig in a freestanding manner on one pile, drilling a borehole at the pile base, and lifting the rig from the pile with lifting cables arranged in a sling arrangement. Thereafter the rig is supported on another pile and a borehole is drilled at the base thereof.

3,825,077

METHOD FOR ANCHORING A DRILLING RIG IN PERMAFROST

George Robert Jackson, R.R. 1, De Winton, Alberta, Canada

Filed Oct. 16, 1972, Ser. No. 297,859
Int. Cl. E21b 7/00
U.S. Cl. 175—57 **1 Claim**



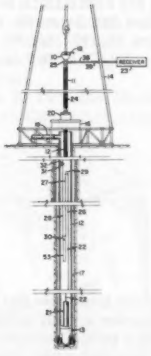
A seismic rig first drills a shallow bore, about 10 feet deep, using its drill stem. The rig equipment is then used to set a retrievable anchor in the bore. The rig is moved and tied to the anchor. It is then in readiness to drill the main bore with increased penetration rate, since it is anchored.

3,825,078

METHOD OF MOUNTING AND MAINTAINING ELECTRIC CONDUCTOR IN A DRILL STRING

Joe K. Heilhecker; Donald B. Wood, and Karl O. Heintz, all of Houston, Tex., assignors to Esso Production Research Company, Houston, Tex.

Continuation-in-part of Ser. No. 267,729, June 29, 1972, abandoned. This application Apr. 12, 1973, Ser. No. 350,459
Int. Cl. E21b 7/00, 47/12
U.S. Cl. 175—57 **25 Claims**



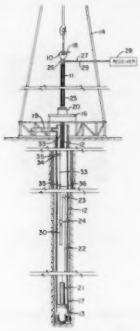
An insulated electric conductor employed in a tubular drill string to transmit electric energy between subsurface and surface locations is arranged within the drill string in a wound, helical, coiled, looped, folded, overlapped or other convoluted configuration. Preferably, the convoluted conductor, or a portion thereof, is maintained in tension. The convoluted configuration provides an excess length of conductor stored within the drill string which enables the conductor to be extended as the drill string is lengthened.

3,825,079

METHOD FOR MOUNTING AN ELECTRIC CONDUCTOR IN A DRILL STRING

Joe K. Heilhecker, Houston, Tex., assignor to Esso Production Company, Houston, Tex.

Filed July 30, 1973, Ser. No. 383,959
Int. Cl. E21b *7/00, 47/12*
U.S. Cl. 175—57 **8 Claims**



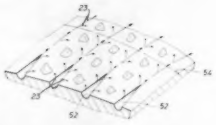
Method for performing wellbore telemetry operations wherein an electric circuit between a subsurface location in a pipe string and the surface is established and maintained by placing an electric conductor in the pipe string to extend from the subsurface location to the surface, arranging the conductor in an overlapped configuration having an upper loop and a lower loop, biasing the lower loop downwardly to remove slack from the conductor, advancing the wellbore in increments of sufficient length to require lengthening the pipe string and for each such incremental advancement, lengthening the pipe string by adding a length of pipe thereto. The length of pipe added to the drill string has extending therethrough an electrical conductor section for lengthening the conductor in the pipe string.

3,825,080

DRILLING BIT FOR EARTH FORMATIONS

Lot W. Short, P.O. Box 252, Greenville, Tex. 75401

Filed Oct. 31, 1972, Ser. No. 302,544
Int. Cl. E21b *9/36*
U.S. Cl. 175—65 **11 Claims**



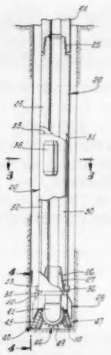
A drilling bit for earth formations that are relatively difficult to drill that incorporate a body portion having a matrix thereon and defining a smooth annular cutting face of a configuration defining an annular line of tangency with a plane disposed in substantially normal relation to the axis of a bore hole being drilled by the bit. A plurality of cutting elements, such as industrial diamonds, are embedded in the matrix and include cutting portions thereof extending beyond the matrix for cutting engagement with the formation being drilled. The cutting elements are oriented in rows radiating from a coolant aperture formed centrally of the bit outwardly about the entire cutting face defined by the matrix. The cutting elements are arranged to create closely spaced generally circular scratches in the formation for erosion thereof as the bit is rotated relative to the formation. A plurality of coolant courses are formed in the matrix and extend from the coolant passage in radiating manner and terminate radially inwardly of said annular line of tangency thereby causing the velocity of the coolant fluid to increase materially as it is evenly distributed in the form of a relatively thin high velocity film flowing over the entire smooth matrix surface disposed radially outwardly of the coolant courses for efficient cooling of each of the cutting elements and removal of cuttings eroded from the formation by the cutting elements.

3,825,081

APPARATUS FOR SLANT HOLE DIRECTIONAL DRILLING

Harvey S. McMahon, 4661 Rhapsody Dr., Huntington Beach, Calif. 92649

Filed Mar. 8, 1973, Ser. No. 339,321
Int. Cl. E21b *7/08*
U.S. Cl. 175—73 **5 Claims**



Method of slant hole directional drilling using a rotary drill wherein the drill collar carrying a plural cone bit is nudged upwardly on each revolution by a radially projecting lobe being cam bearing on the surface at the low side of the hole, in conjunction with the action of one oversize cone in the bit which upon each upward nudging of the drill collar cuts in a predetermined laterally angular direction, whereby the direction of the well bore will be altered.

The apparatus embodies a two cone or tricone bit in which the teeth of one cone are radially enlarged over the teeth of the other cone or cones, the bit being mounted on a drill collar with the larger cone at an angular displacement from a radially projecting lobe or cam mounted on the drill collar.

3,825,082

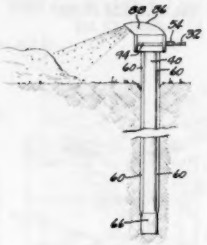
APPARATUS FOR FORMING HOLES IN EARTH AND SETTING SUBTERRANEAN STRUCTURES THEREIN

Roy J. Woodruff, 354 Menke Rd., Michigan City, Ind. 46360

Filed Mar. 12, 1973, Ser. No. 340,238
Int. Cl. E21b *21/00;* **E21c** *7/02*
U.S. Cl. 175—211 **6 Claims**

A method of forming a hole in earth and of installing a subterranean structure, wherein a rigid open-ended tube is lowered into the earth and simultaneously air under pressure is discharged into the lower end of the tube to displace and discharge soil. The subterranean structure is inserted in the tube at desired position and the tube is withdrawn while the structure remains in position. The apparatus employed to

practice the method includes means carried by the tube providing a gas pressure passage with an inlet at one end of the tube and an outlet into the opposite end of the tube, and



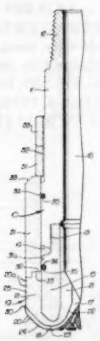
means by which the tube may be supported at the end adjacent the inlet. The supported end of the tube may mount a shiftable deflector for soil being discharged.

3,825,083

DRILL BIT AND STABILIZER COMBINATION

Frank O'Dell Flarity, Salt Lake City, Utah, and Waymon Rhea Eustace, Midland, Tex., assignors to Christensen Diamond Products Company, Salt Lake City, Utah

Filed Feb. 2, 1972, Ser. No. 222,826
Int. Cl. E21b *9/36, 17/10*
U.S. Cl. 175—394 **18 Claims**



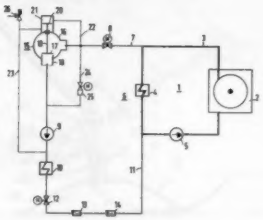
A closely coupled bore hole drill bit and stabilizer combination includes a body structure adapted to be coupled to a rotary drill string or downhole motor, the body structure having cutting elements on its lower portion for drilling the bore hole, the upper portion of the body structure being surrounded by a separate stabilizer in juxtaposition to the upper end of the lower portion of the body structure, the stabilizer being removably coupled to the body structure, as through the agency of a clutch device, by a threaded coupling, or by welding, allowing readily uncoupling or disconnection of the stabilizer from a worn drill bit and its appropriate association with another operable drill bit.

3,825,084

SHUT-OFF MECHANISM FOR LOW PRESSURE LINES CONNECTED TO HIGH PRESSURE LINES IN NUCLEAR REACTORS

Hans Fruth, Buckenhof, and Wolfgang Muller, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed May 16, 1972, Ser. No. 253,881
Int. Cl. G21c *15/18*
U.S. Cl. 176—65 RE **12 Claims**



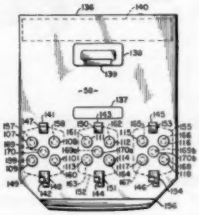
A control mechanism is disclosed for shutting off a low pressure liquid or gas line connected to a high pressure line. The control mechanism may be comprised of a piston controlled check valve mounted in the lower pressure line. The upper side of an actuator piston in the check valve is connected to the high pressure input side of the input line so that whenever the pressure at the input side becomes high, the check valve is closed. To open the valve a pump or other pressure generator is mounted after the valve and is connected by a pressure line to the lower side of the actuator piston. A safety valve is mounted within this pressure line to insure that a high pressure cannot be formed in this line to force the check valve open. To permit opening of the valve when required, a valve controlled, pressure equalization line is connected between the input line and the intake side of the pump.

3,825,085

PRICE COMPUTING SCALE WITH PARITY CHECK OF PRICE ENTRY

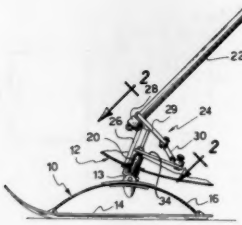
Orval J. Martin, Toledo, Ohio, assignor to Reliance Electric Company, Toledo, Ohio

Filed Sept. 20, 1973, Ser. No. 398,969
Int. Cl. G01g *23/38, 23/22*
U.S. Cl. 177—3 **6 Claims**



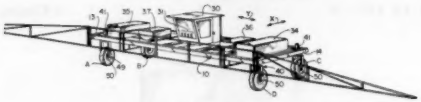
A computing weighing scale system comprising photosensitive means for setting up selected price factors in the scale's computer and interlock means for preventing initiation or completion of the system's operating cycle, which includes computing and printing, if part of the photosensitive means is defective or is missing or is plugged with foreign material.

3,825,086
STOP DEVICE FOR SNOWMOBILE STEERING MECHANISM
Jerome Bombardier, Valcourt, Quebec, Canada, assignor to Bombardier Limited, Valcourt, Quebec, Canada
Filed Dec. 21, 1972, Ser. No. 317,274
Claims priority, application Canada, Dec. 15, 1972, 159157
Int. Cl. B62m *27/02*
U.S. Cl. 180—5 R **6 Claims**



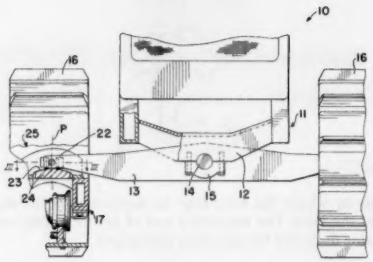
The disclosure herein describes a stop device for limiting the angular displacement of a snowmobile ski leg which comprises a collar fixedly secured to the lower portion of the ski leg housing and a projecting element extending from the lower portion of the ski leg and having one extremity extending through an opening in the collar. The opposite sides of the opening define the limits of the angular displacement of the ski leg.

3,825,087
MOTORIZED AGRICULTURAL TYPE CARRIER
William A. Wilson, 815 Woodland Ave., Woodland, Calif. 95695
Filed Aug. 24, 1973, Ser. No. 391,042
Int. Cl. B62d *49/40*
U.S. Cl. 180—6.48 **13 Claims**



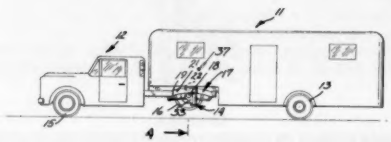
A carrier vehicle useful for agricultural or industrial purposes, the vehicle having a large flat platform for carrying equipment and materials, and also capable of supporting various farm implements in operative positions, the platform comprising a frame supporting motor-driven ground engaging wheels in its corners each carried by an adjustable-height caster assembly, the width of the frame being power-adjustable and all four wheels being selectively power-steered, the frame carrying engine-driven pumps supplying hydraulic fluid to the wheel motors, to the frame expansion means, and to the steering means through a series of control valves clustered in a locker in the frame, and the vehicle having a rotatable operators cab connected by flexible control cables to the control valves in the frame.

3,825,088
EQUALIZER BAR MOUNTING FOR TRACK-TYPE VEHICLES
Kermit L. Copeland, Bellevue, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Dec. 7, 1972, Ser. No. 312,819
Int. Cl. B62d *55/08*
U.S. Cl. 180—9.5 **12 Claims**



The undercarriage of a track-type vehicle comprises a pair of endless tracks each mounted on a track roller frame. An equalizer bar is pivotally mounted at the longitudinal axis of the vehicle and each end thereof is connected to a respective one of the track roller frames by a lost-motion connection. Such connection comprises a pin attached to a respective end of the equalizer bar and disposed in parallel relationship with respect to the vehicle's longitudinal axis and at least one pair of parallel bearing blocks mounted on either side of the pin.

3,825,089
HOUSE TRAILER HOOK-UP
David M. Murphy, Mason City, Iowa, assignor to David Manufacturing Company, Mason City, Iowa
Continuation of Ser. No. 115,587, Feb. 16, 1971, abandoned.
This application Oct. 5, 1972, Ser. No. 296,319
Int. Cl. B62d *53/04*
U.S. Cl. 180—12 **15 Claims**



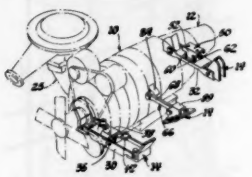
The disclosure is directed to the combination of a house trailer and a truck or similar vehicle for hauling the trailer. The truck has front and rear wheels, the latter of which are retractable against the bias of suspension leaf springs. The front end of the trailer includes a retractable stand on each side for supporting the trailer when at rest. To transport the trailer, its forward portion is received by the bed of the truck, which is disposed over the rear wheels. The trailer stands are constructed and arranged to engage the rear wheels upon retraction to elevate the wheels from the ground and rigidly secure the trailer to the truck bed.

3,825,090

ROTAKY ENGINE AND TRANSMISSION ASSEMBLY MOUNTING SYSTEM

Donald L. Runkle, Royal Oak, and Charles N. Hughes, Milford, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 8, 1973, Ser. No. 386,513
Int. Cl. B60k 5/12
U.S. Cl. 180—64 R 4 Claims



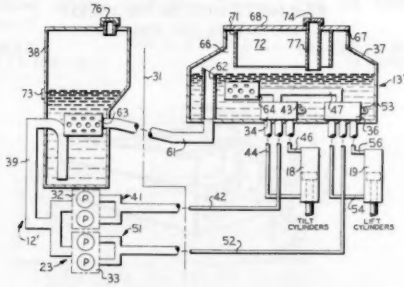
A rotary engine and transmission assembly mounting system having a pair of elastomeric mounts secured to the vehicle structure and the bottom of the rotary engine and transmission assembly for controlling vertical, lateral, and fore-aft movements and also yaw, pitch and roll of the engine and transmission assembly and an additional elastomeric mount including a strut for controlling only lateral movement, yaw and roll of the engine and transmission assembly.

3,825,091

HYDRAULIC FLUID CIRCUIT FOR VEHICLE HAVING ARTICULATED SECTIONS

Thomas H. Geselbracht, Joliet, and David S. Vinton, Morton, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 834,776, June 19, 1969, Pat. No. 3,604,205. This application May 24, 1971, Ser. No. 146,509
Int. Cl. F15b 15/18
U.S. Cl. 180—53 R 2 Claims



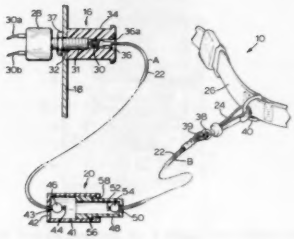
A hydraulic circuit having one or more pumps adjacent motor means in a machine with hydraulic motors which are supplied by the circuit being located in a relatively remote location from the pumps. A control valve is associated with each hydraulic motor and includes a return line in communication with a first hydraulic fluid tank. An assembly of one or more pumps for delivering fluid under pressure to the control valves is located adjacent the motor means and is driven by the motor means. A second hydraulic fluid tank is associated with the pump assembly, the second tank providing fluid to the pumps and being in communication with the first tank by a return conduit for delivering fluid from the first tank to the second tank. To prevent rupture of the first tank, a baffle is preferably arranged within that tank to assure a constant air pocket above the fluid.

3,825,092

SAFETY DEVICE FOR MOBILE CONVEYANCES

Kenneth Graydon, 298 Wellington St., and Harley W. Douglas, 38A King St. East, both of Ingersoll, Ontario, Canada

Filed Apr. 10, 1972, Ser. No. 242,581
Int. Cl. B60k 27/08
U.S. Cl. 180—82 R 3 Claims



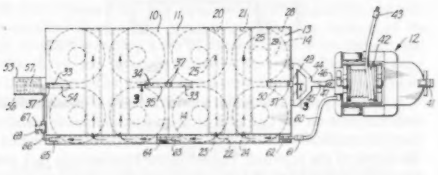
The device is used in conjunction with conveyances powered by internal combustion engines having electrical ignition systems. The device includes an on-off switch which is connected in series with the ignition system and which includes a plunger which moves from a retracted position in which the electrical system is activated to an extended position in which the engine is shut down. A cord is connected at one end to the plunger and at the other end, to attachment means which is adapted to be releasably connected to the driver of the conveyance. Incorporated in the cord is a severable member which, upon application by the cord of a tensile force greater than the force required to move the plunger from a retracted position to an extended position under normal weather conditions, separates so that the cord no longer interconnects the plunger and the attachment means. The cord is of sufficient length to accommodate movement of the driver while on the conveyance only so that upon removal of the driver from the conveyance, the cord becomes taut with resulting movement of the plunger from a retracted to an extended position thereby shutting off the engine.

3,825,093

MODULAR AIR CUSHION TRANSPORTING SYSTEM

Robert E. Burdick, and Baxter K. Wolf, both of Santa Barbara, Calif., assignors to Rolair Systems, Inc., Santa Barbara, Calif.

Filed Jan. 2, 1973, Ser. No. 320,138
Int. Cl. B60v 1/18
U.S. Cl. 180—119 5 Claims



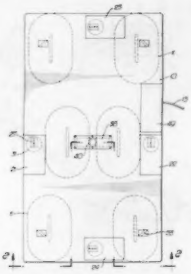
A modular system for moving heavy loads, using a plurality of air cushion transporters coupled together. A plurality of identical air cushion transporters with load carrying platforms riding on air bearings, and means for mechanically and pneumatically interconnecting the transporters for movement as a unit.

3,825,094

REMOTE CONTROL FOR AIR BEARING TRANSPORTERS AND THE LIKE

Robert E. Burdick, Santa Barbara, Calif., assignor to Rolair Systems, Inc., Santa Barbara, Calif.

Filed Aug. 6, 1973, Ser. No. 385,963
Int. Cl. B60v 1/00
U.S. Cl. 180—125 11 Claims



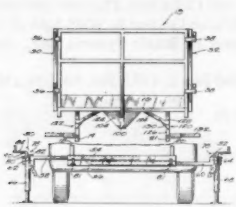
An air cushion transporter for moving large loads, typically 300,000 pounds, on air cushions using remote control permitting the operator to walk along with the transporter guiding it in forward, reverse, right and left rotational directions. A transporter with load carrying platform, plurality of air bearings, plurality of drive units and a pivot unit, and a remote control unit with components for selectively, separately and simultaneously actuating the drive and pivot units. A remote control unit readily carried by the operator providing manual control of direction and velocity and dead-man control for air bearing shut-off and drive motor braking. A transporter suitable for operation with air or other gas or a liquid.

3,825,095

AERIAL SCAFFOLD FOR VEHICLE

Albert L. Clark, West Bend, Wis., assignor to Pac-Craft Products, Inc., West Bend, Wis.

Filed Oct. 10, 1972, Ser. No. 296,383
Int. Cl. E04g 1/24
U.S. Cl. 182—17 2 Claims



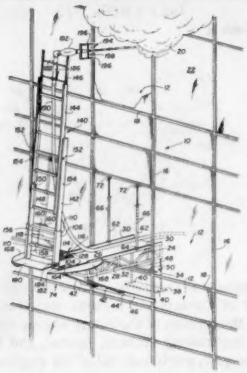
A vertically movable aerial scaffold which is mountable and demountable on the bed of a pick-up truck includes stabilizer bars telescopically received in channel members connected to the frame of the scaffold. The stabilizer bars include jack posts pivotally mounted to the bars for movement from an erected position for use to a collapsed storage position. The scaffold also includes a rear railing or guard with hinged side gates which can be folded against the rear gate when the platform is stored vertically during transportation of the vehicle. Other features include a hinged front safety gate, collapsible steps and a centrally located sleeve in the platform adapted to receive a column which forms part of a boom or a laterally extending access ramp.

3,825,096

FIRE LADDER EXTENSION APPARATUS

Robert F. Mendes, 42 Pearsall Pl., Merrick, N.Y. 11566

Filed Mar. 14, 1973, Ser. No. 341,143
Int. Cl. E06c 1/34
U.S. Cl. 182—86 19 Claims



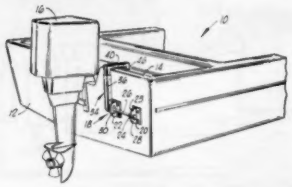
Ladder extension means for fighting fires comprising a portable support positionable in a window or other wall opening. The support is provided with means for fixedly bracing it against movement, and means at its outer end to receive a ladder. The means for receiving the ladder is movable so that the ladder may be positioned in selected altitudes with respect to the building providing extension from the wall opening to another part of the building, such as from floor to floor.

3,825,097

STEP ASSEMBLY APPARATUS FOR USE ON SKI BOAT OR THE LIKE

Harold D. Owen, 2605 Woodruff Rd., Edmond, Okla. 73034

Filed July 13, 1973, Ser. No. 378,921
Int. Cl. B60r 3/00; E06c 5/00
U.S. Cl. 182—91 5 Claims



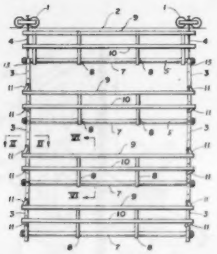
An improved step assembly apparatus for boarding a boat over the stern transom thereof, wherein a hook-shaped extendible step assembly is pivotally connected to a portion of the transom by means of a resilient shaft rotatably connected to a mounting bracket and extending therefrom a predetermined distance, parallel to the transom surface and at a relatively short distance therefrom, through an elongated slot formed through a portion of a second mounting bracket. The resilient shaft is spaced a predetermined distance below and parallel with the stern gunwale and the shank portion of the hook-shaped step assembly is extended a like distance from the pivot shaft such that the assembly may be pivoted to a storing position wherein the hook-shaped step is secured to the gunwale, and the torsion effect produced by the resilient shaft bent upwardly within the upper portion of the elongated slot formed through a portion of the second mounting bracket retains the assembly in a stored position.

3,825,098

HANGING SCAFFOLDING

Thomas M. Shingler, Pittsburgh, Pa., assignor to Cyclops Corporation, Pittsburgh, Pa.

Filed Dec. 21, 1972, Ser. No. 317,180
Int. Cl. E04g 3/10
U.S. Cl. 182—106 **9 Claims**



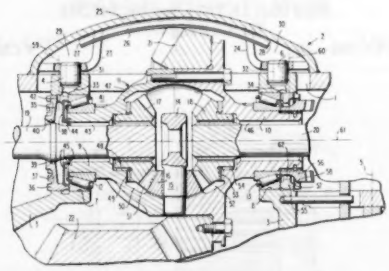
A handrail system for hanging scaffolding including a pair of spaced, confronting ladders suspended on an outriggered beam. The rungs of the ladders directly support the scaffold decks of a plurality of stages. A handrail and midrail for each stage is secured, at its ends, to the outer sides of the ladders by pivotal handrail brackets attached to channel clamps which are adjustably fastened within the rail to compensate for variations in distance between the confronting ladders. Special flange clamps are provided for supporting the deck side rails without the necessity of perforating and weakening of the side rails. A toe rail or plate prevents tools and equipment from falling onto lower stages or the ground.

3,825,099

LUBRICATING SYSTEM FOR AXLE GEAR

Wilhelm Hopf, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed Oct. 12, 1972, Ser. No. 296,874
Claims priority, application Germany, Oct. 12, 1971, 2150676
Int. Cl. F16n 7/26
U.S. Cl. 184—6.12 **51 Claims**



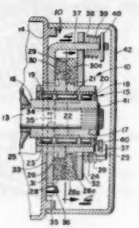
A lubricating system for an axle gear inserted into an axle bracket of a motor vehicle in which the axle bracket includes one or several collecting chambers in the form of pockets for lubricant centrifuged up by the bevel gear while the axle gear housing includes one or several distributor chambers for the lubricant; lubricant connections are provided both between a distributor chamber and a collecting chamber as also between a distributor chamber and at least one lubricating place of the differential gear housing such as the teeth of differential bevel gears and a conical roller bearing or bearings of the differential gear housing.

3,825,100

HOIST WITH CONSTANT PRESSURE ONE WAY BRAKE

Harvey Freeman, Brinkley, Ark., assignor to Eaton Corporation, Cleveland, Ohio

Filed June 14, 1972, Ser. No. 262,909
Int. Cl. F16d 67/02
U.S. Cl. 188—71.2 **4 Claims**



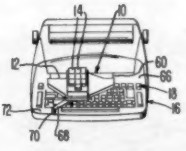
A low cost hoist operated by a motor on whose shaft is an overrunning clutch that rotates a load brake disc when the motor shaft rotates in load lowering direction, the disc engaging between a pair of brake plates acting with constant frictional pressure against opposed surfaces of the disc and enabling the hoist to support a load. Heat that is developed by slip friction will be divided between the brake plates when the motor operates to lower a load, and one of those plates is in heat conducting surface contact with the hoist frame, controlling temperatures due to the slip friction and reducing deterioration of the brake and hoist. The brake disc is formed by two disc portions in contact and mounted on the clutch through keying portions so staggered as to offer surfaces that locate the disc in a predetermined axial position on the clutch.

3,825,101

AUXILIARY KEYBOARD DEVICE FOR KEY-OPERATED MACHINE

Neal B. Wineman, 210 Warren Rd., San Mateo, Calif. 94402

Filed June 5, 1972, Ser. No. 259,635
Int. Cl. B41j 5/30
U.S. Cl. 197—19 **11 Claims**



A 10-key keyboard device adapted to be removably placed over the keyboard of a key-operated machine and having motion-transfer bars which mechanically couple certain of its keys to corresponding keys of the machine even though the device keys are spaced laterally from the corresponding machine keys. The device is suitable for providing a 10-key format for the numeral keys of a typewriter.

3,825,102

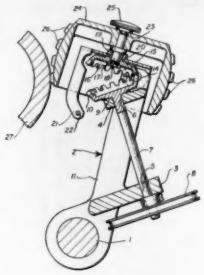
TYPE HEAD TILT AND ROTATING MECHANISM

Herbert Decker, Lauf, Germany, assignor to Triumph Werke Nuernberg A.G., Nuernberg, Germany

Continuation of Ser. No. 76,733, Sept. 30, 1970, abandoned. This application Nov. 21, 1972, Ser. No. 308,622
Int. Cl. B41j 1/32
U.S. Cl. 197—55 **7 Claims**

A tilt bridge for a type carrier carries unitarily rotatable thereon a type carrier and a gear, and such gear is in constant

engagement with another gear at an axis location whereabout the tilt bridge is required to tilt. The gear on the tilt bridge has freedom for tilting movement about said axis location in



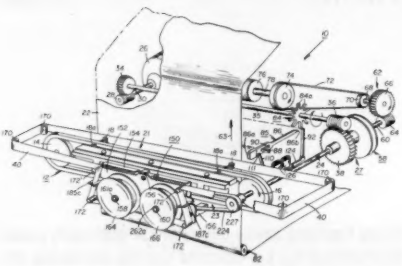
respect to the other gear and is in constant mesh therewith for receiving therefrom rotary type-selective movements for the type carrier. The tilt and rotate axes are mounted on a swingable support whereby the carrier may be swung to print.

3,825,103

HIGH-SPEED PRINTER HAVING IMPROVED RIBBON DRIVING, REVERSING AND TENSIONING MECHANISM

Arthur F. Riley, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Mar. 27, 1973, Ser. No. 345,407
Int. Cl. B41j *33/22*
U.S. Cl. 197—164 **18 Claims**



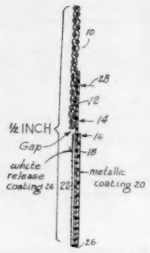
A high-speed impact printer has an improved ribbon driving, reversing, and tensioning mechanism that is jam-proof, of compact-simplified construction, reliable and substantially maintenance free in operation. By being compact, the drive mechanism may be centrally located at the front of an impact printer so as to facilitate spool and/or ribbon replacement. The drive mechanism, through the use of two sets of pivotally mounted, two-stage biased planetary coupling gears, effects gradual rotational engagement and disengagement of the selectively coupled driving and driven gears of the drive mechanism. This results in minimal gear wear, and produces smooth, automated reversal of ribbon travel, while the latter is continuously maintained under uniform tension.

3,825,104

COMPOSITE INKING AND OBLITERATING TYPEWRITER RIBBON

William H. Wolowitz, 6905 Persimmon Tree Rd., Bethesda, Md. 20034

Filed Mar. 26, 1973, Ser. No. 345,127
Int. Cl. B41j *31/02*
U.S. Cl. 197—172 **8 Claims**



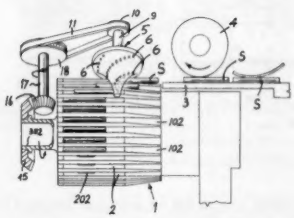
A class of "self-correcting" typewriter ribbons is described, having an inking portion and an obliterating portion, whose members share the common property of having those portions spaced apart from one another by a gap (either edgewise or face-wise) to ensure against transfer of ink to the obliterating material. The gap facilitates manufacture, and in one form, or group of forms, a metallic layer on one of the portions is used to reduce friction in the ribbon guides, improve the appearance of the ribbon, and provide a visual indication to the user that the ribbon is properly installed for use.

3,825,105

DECELERATOR OF CIGARETTES COLLECTED BY A FLUTED DRUM

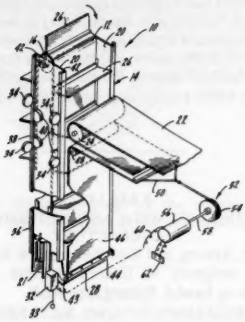
Athos Cristiani, Bologna, Italy, assignor to AMF Incorporated, White Plains, N.Y.

Filed Mar. 15, 1973, Ser. No. 341,393
Int. Cl. B65g *47/14*
U.S. Cl. 198—20 C **9 Claims**



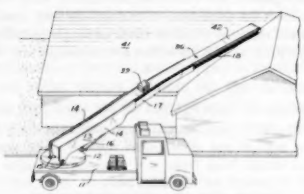
In combination with a rotatable fluted catcher drum, a rotatable pneumatic decelerator means providing braking for reducing the axial speed of rod-like members entering endwise into the open flutes of the drum to prevent damaging the rod-like members, and means for coordinating the rotation of the drum and decelerator means.

3,825,106
AUTOMATIC CRATE FILLER
Irwin Edward Wickam, Dodge City, and Jerry K. Perkins, Arkansas City, both of Kans., assignors to Speed King Manufacturing Company, Inc., Dodge City, Kans.
Filed Mar. 29, 1972, Ser. No. 239,101
Int. Cl. B65g 37/00
U.S. Cl. 198—101 6 Claims



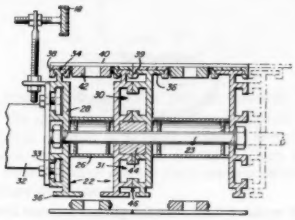
An apparatus for depositing a quantity of articles in a container utilizing an endless conveyor mounted on a vertically movable support structure. Belt curtain means attached to the support structure adjacent the article support means of the conveyor aid in confining the articles being transported. When the article level in the container reaches a predetermined height, a limit switch is activated, initiating drive means connected to the belt curtain. Tension applied to the support structure by the belt curtain incrementally and vertically raises the support through a preselected distance or interval, whereby the limit switch is again deactivated and the support structure stops.

3,825,107
EXTENDIBLE CONVEYOR SYSTEM
John M. Cary, 2958 Maryann Ln., Pittsburgh, Calif. 94565, and Michael F. Mahacek, 9092 Cherry Ave., Orangevale, Calif. 95662
Filed July 26, 1971, Ser. No. 166,186
Int. Cl. B65g 15/26
U.S. Cl. 198—139 7 Claims



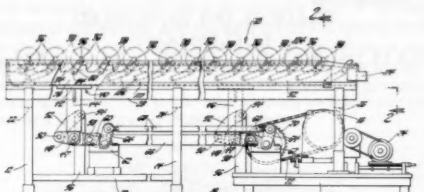
An extendible and retractable conveyor includes a telescoping arrangement of conveyor sections or beam members which may be mounted on a truck or other vehicle. A first or outer beam member is pivoted and inclined upwardly on a rotatable base member. A second or intermediate beam member is movable longitudinally along and with respect to the first beam member, and a third or inner beam member is further longitudinally movable along and relative to the second beam member. A continuous conveyor belt has a first reach and a second reach spanning the combined lengths of the beam members and extending and retracting therewith. Two pulleys, supporting four additional reaches of the belt, are mounted to move longitudinally of the first beam member to retract and extend in complement to the extending and retracting of the second and third beam members. Friction gears or the like are mounted on the second beam member to provide a differential drive means for extending and retracting the third beam member and the first two reaches of the conveyor belt at twice the rate of complementary retracting and extending of the pulleys supporting the four additional belt reaches.

3,825,108
CONVEYOR ASSEMBLY WITH CONVERTIBLE EXTRUSIONS
Guthrie B. Stone, Honeoye, N.Y., assignor to Stone Conveyor, Inc., Honeoye, N.Y.
Filed Sept. 5, 1972, Ser. No. 286,211
Int. Cl. B65g 15/60
U.S. Cl. 198—204 9 Claims



A conveyor assembly comprising a pair of elongated convertible side frame sections of extruded aluminum, or the like, each of said frame members including a vertical side wall with first and second elongated support flanges at the top and bottom edges thereof, respectively, said flanges being of different horizontal dimensions to accommodate different size standard conveyor chains. The frame members are selectively oriented during installation to provide the desired flanges at the top to support a conveyor chain of corresponding dimensions with the pivot joints of the chain disposed between the opposite top flanges.

3,825,109
ACCUMULATING LIFT-AND-CARRY CONVEYOR
John M. Stockbridge, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed June 25, 1973, Ser. No. 373,186
Int. Cl. B65g 25/04
U.S. Cl. 198—219 3 Claims



An accumulating lift and carry conveyor for moving individual parts along the longitudinal axis of the conveyor. The conveyor includes a pair of laterally spaced side plates having a series of transversely aligned stations formed in the upper portions of the side plates for supporting and spacing the

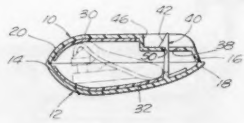
parts. A lifter member having a plurality of carrier members is located between the side plates and is adapted to be driven in a closed circular path about an axis extending transversely to the longitudinal axis of the conveyor. The side plates carry a plurality of actuator members which cooperate with the carrier members for moving the latter to appropriate positions so as to cause the individual parts to be moved from one station to the next or to remain in the accommodating stations depending upon whether one or more of the stations is unoccupied.

3,825,110

PLASTIC CASE FOR GLASSES

Frank Halbich, 6132 Jamieson Ave., Reseda, Calif. 91335, and Stuart W. Needleman, 9524 Babbit St., Northridge, Calif. 91324

Filed July 14, 1972, Ser. No. 271,876
Int. Cl. A45c *11/20*; **B65d** *45/18, 1/22*
U.S. Cl. 206—6 **1 Claim**



A plastic molded hard case for glasses formed from integral molded halves connected by a hinge part and contoured to form a rigid case, the halves having abutting perimetral edges and latch means to latch the halves together.

3,825,111

CONTAINER CONTAINING A CARBONATED PRODUCT

David D. Pipkins, Downers Grove, Ill., assignor to The Valspar Corporation, Minneapolis, Minn.

Division of Ser. No. 154,411, June 18, 1971, Pat. No. 3,747,523, which is a continuation-in-part of Ser. No. 80,833, Oct. 15, 1970, Pat. No. 3,705,044. This application Apr. 18, 1973, Ser. No. 352,214
Int. Cl. B65d *81/00*
U.S. Cl. 206—84 **4 Claims**

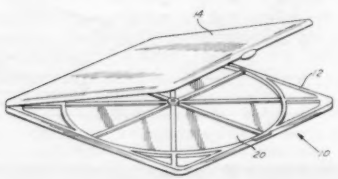
A container has a carbonated paint or ink therein and carbon dioxide is interstitially spaced in an amount sufficient to evolve into the head space of the container to provide a protective atmosphere having improved "anti-skinning" characteristics.

3,825,112

RECORD COVER

Aaron C. Schumaker, Denver, Colo., and Isaac K. Hay, Jr., Lafayette, Ind., assignors to Crested Butte Records, Inc., Denver, Colo.

Filed Oct. 30, 1972, Ser. No. 301,822
Int. Cl. B65d *85/30*
U.S. Cl. 206—310 **7 Claims**



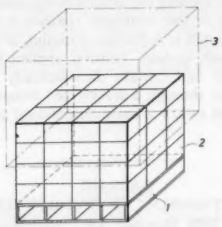
A phonograph record cover preferably is composed of a high strength plastic material and is made up of two panels each having a shallow recessed portion on its inner surface opening toward the other, and the panels are connected along a common edge by a living hinge. The recessed portion in each panel is provided with a plurality of radially extending ribs and a circular rib in one of the panels defines an annular shoulder against which the outer perimeter of a phonograph record is adapted to engage. The extent of projection or depth of the radial ribbing on the one panel which is disposed within or inward of the circular rib is less than that of the circular rib whereby a record can be placed against the radial ribbing so as to be substantially flush with the circular rib; and when the opposite panel is pivoted into overlying relationship with the one panel, a record in the cover will be snugly retained between the annular shoulder around the perimeter of the record and the radial ribs which engage opposite faces of the record.

3,825,113

PACKING ASSEMBLY AND METHOD OF ITS MANUFACTURE

Emil Kramer, Nyborg, and Eigil Vangsgaard, Bovense, both of Denmark, assignors to Interessentskabet Nyborg Plast, Fabrikation og handel, Nyborg, Denmark

Filed July 9, 1971, Ser. No. 161,062
Claims priority, application Denmark, Aug. 10, 1970, 4099/70
Int. Cl. B65d *19/00, 65/10*; **B65b** *53/02*
U.S. Cl. 206—386 **5 Claims**



A packing assembly including a plurality of single packings each containing one or more articles and being surrounded by a plastic foil. The assembly is surrounded wholly or partly by two layers of plastic foil which are shrunk by heat. The invention also relates to a method of manufacturing a packing assembly of said type, in which a stack of single packings is surrounded by two plastic foils which are subsequently shrunk by heat.

3,825,114

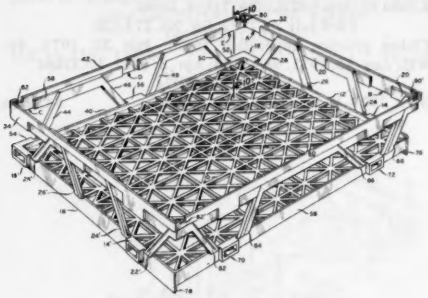
NEST AND STACK CONTAINER

Lewis T. Johnson, and Willard E. Bull, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 9, 1972, Ser. No. 261,371
Int. Cl. B65d *21/04*
U.S. Cl. 206—507 **18 Claims**

A nest and stack container adapted to nest in a like oriented lower container of like construction, or to stack in said lower container when turned with respect thereto. The walls of the container comprise inclined bars which extend between the bottom and an upper rim of the container. Said inclined bars are arranged such that the bars of an upper container parallel

the bars of a lower container during nesting. Opposite ends or sides of the container are provided with guide means which



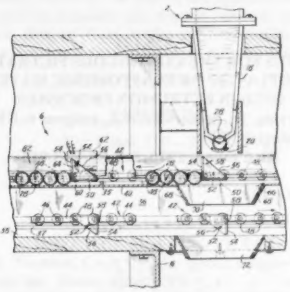
make possible "blind stacking" of the containers, even at heights greater than the height of the person stacking the containers.

3,825,115

COIN ROLL PICK-UP CONVEYOR

Thomas J. Black, Vienna, and Frank L. Bennett, Chantilly, both of Va., assignors to Universal Machine Company, Inc., Falls Church, Va.

Filed Oct. 30, 1973, Ser. No. 411,147
Int. Cl. B07c
U.S. Cl. 209—73 **9 Claims**



A plurality of coin wrapping machines are arranged so that each delivers sequential rolls of coins to a tiltable cradle associated therewith and which is caused to tilt at a controlled time to drop the roll onto a common conveyor apparatus having a fixed surface, the rolls are dropped immediately behind pushers on roller chains rollable on the surface. Spaced pushers on the chains are far enough apart to accommodate a roll from each machine so that each roll drops directly onto the surface even though other rolls are in the same space between adjacent pushers. An open grid below each cradle permits loose coins to pass through the conveyor system but retains unbroken rolls. Overhead tracks guide the roller chains along upwardly curved portions of the surface.

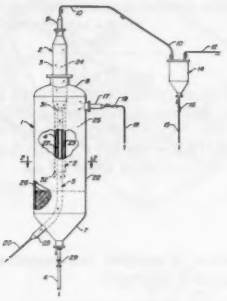
3,825,116

PARTICLE DISENGAGING AND FINES REMOVAL

Arthur R. Greenwood, Niles, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Jan. 15, 1973, Ser. No. 323,578
Int. Cl. B07b *7/00*
U.S. Cl. 209—141 **7 Claims**

An apparatus is disclosed for disengaging particles from a mixture of a lift fluid and particles, and for the separation of fine particles from larger particles. The apparatus utilizes a two-stage elutriation conduit to produce current contacting of lift fluid and particles and cause the separation of fine particles from larger particles. A higher upward fluid velocity in the smaller cross-sectional area lower stage of the



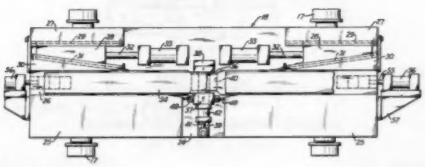
elutriation conduit enhances fine particle removal. The lower velocity in the upper stage increases large particle retention. The elutriation conduit is present within a larger receiving hopper which receives the large particles which have been separated. Fine particles and lift fluid are recovered from the top of the elutriation conduit.

3,825,117

SUPPORT FOR METAL BAR BEING TAPERED

Richard P. Krause, 1503 Highland Ave., New Castle, Pa. 16105

Filed Jan. 15, 1973, Ser. No. 323,504
Int. Cl. B21d *7/08;* **B23q** *3/08;* **B25b** *1/06*
U.S. Cl. 269—217 **8 Claims**



A support with an upper surface for receiving a metal bar while it is being rolled to taper it also has laterally spaced side walls extending upwardly along the opposite sides of the end portions of that surface, with the walls at one end spaced from the walls at the other end to form a gap. In the gap there are gripping means mounted on the support for engaging the opposite edges of a bar on said surface. The support is provided with means for lifting the bar after tapering so that it can be grasped and carried away from the support.

3,825,118

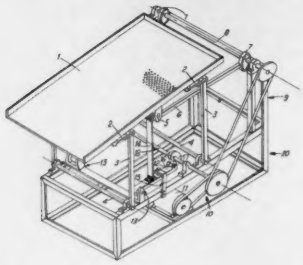
OSCILLATING SCREEN

Ron Feller, Ramat-Gan, Israel, assignor to The State of Israel, Ministry of Agriculture, Jerusalem, Israel

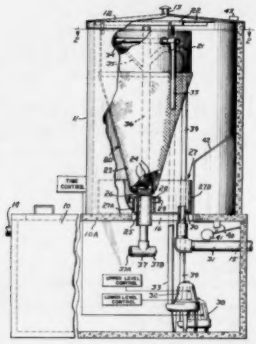
Filed Apr. 17, 1972, Ser. No. 244,677
Claims priority, application Israel, May 20, 1971, 36925
Int. Cl. B07b *1/36*
U.S. Cl. 209—330 **2 Claims**

Device for the classification of solid objects of the oscillating screen type. In operation the oscillating screen is gradually

pulled down against the action of springy means. From the lowermost position the screen is released and receives an upward thrust which is abruptly interrupted by stop means, whereby the screen is unclogged.

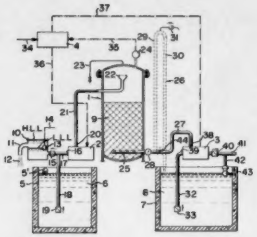


3,825,119
WASTE WATER TREATMENT UNIT
Kai Lennart Rost, The Ledge, Hallowell, Maine 04347
Filed Mar. 8, 1973, Ser. No. 339,184
Int. Cl. B01d *21/24, 35/00*
U.S. Cl. 210—97 **19 Claims**



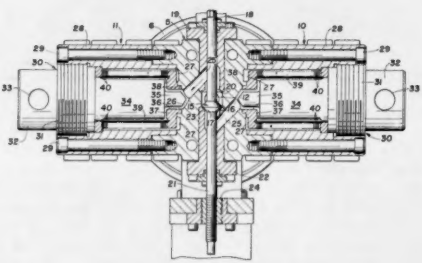
A waste water treatment unit, particularly adapted to meet household requirements, has a tank receiving the waste water and a chamber above the tank. A filter within the chamber consists of a downwardly and inwardly tapering fabric bag containing a trickling filter body and has its bottom end open and in communication with the tank. A pump in the tank, operable between maximum and minimum levels, delivers the waste water through a conduit provided with a distributor or diffuser above the filter body and a return pipe in communication with the tank and provided with an aspirator by which returned waste water draws air into the tank. The return pipe adjacent the distributor is of a smaller diameter than the distributor with the result that pressure builds up in the distributor forcing some of the circulating water through lengthwise slits and into the filter with solids continuing with the rest of the water into and through the return pipe. Water passing downwardly through the trickling filter body to the bottom of the bag returns to the tank while that filtered by the bag is discharged from the unit. Time controlled means are also shown for use in aerating the tank contents by circulating them through the chamber and into the return pipe by bypassing the distributor.

3,825,120
SIMPLIFIED FILTERING SYSTEM
Toshinao Takahashi, Tokyo, Japan, assignor to Kabushiki Kaisha Sayama Seikakusho, Tokyo, Japan
Filed July 20, 1972, Ser. No. 273,528
Claims priority, application Japan, July 28, 1971, 46-55935; Aug. 13, 1971, 46-60988; Apr. 5, 1972, 47-33464
Int. Cl. B01d *23/24*
U.S. Cl. 210—104 **5 Claims**



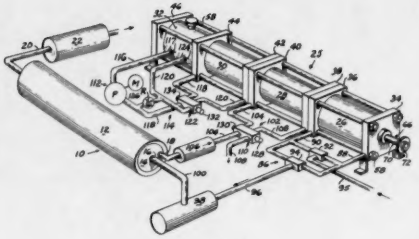
A simplified filtering system capable of repeating filtration of liquid and cleaning of the filter of the system with the filtrate alternately by use of simple electric control means and valvular means.

3,825,121
APPARATUS FOR THE CONTINUOUS FILTRATION OF THERMOPLASTIC OR ELASTOMERIC MATERIALS USED IN EXTRUSION PROCESSES
Edgar W. Irving, Jr., Somerville, N.J., assignor to GK Systems, Inc., Flemington, N.J.
Filed June 1, 1973, Ser. No. 365,951
Int. Cl. B01d *29/36*
U.S. Cl. 210—132 **9 Claims**



The disclosure is that of an invention directed to a dual unit changeover filter, particularly for use with hot melt plastics, in which the changeover from one unit to the other can be effected without adversely affecting the quality characteristics of the throughput. Sequentially operated valves, with appropriate bleed unit connecting passages, are employed to condition an idle filter unit for operation while still permitting the operating filter unit to operate properly until the idle filter unit has been placed on line, after which the previously operating filter unit becomes shut down.

3,825,122
REVERSE-OSMOSIS PUMP
Julian S. Taylor, 8300 S.W.8, Oklahoma City, Okla. 73108
Filed June 11, 1973, Ser. No. 369,034
Int. Cl. B01d *31/00*
U.S. Cl. 210—134 **10 Claims**

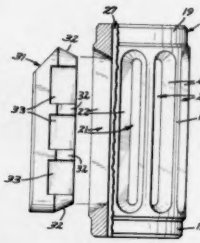


A multiple stage pump comprising a main chamber, a booster chamber and a driving chamber each having a piston therein with the pistons interconnected by a common piston rod for reciprocating the pistons in unison. Main conduit means connects the main chamber with a fluid supply and the inlet of a reverse-osmosis device. Second conduit means connects the fluid reject discharge port of the reverse-osmosis device with the booster chamber. Hydraulic pump means including a pressure compensated pump and hydraulic conduits connected with a hydraulic fluid reservoir is connected with the driving chamber. Control means actuated by the reciprocating action of the piston rod operates valve devices in the hydraulic conduits and second conduits to maintain a continuous flow of fluid, under a predetermined pressure, from the main chamber to the reverse-osmosis device.

ERRATUM

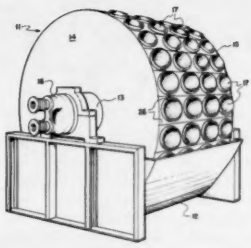
For Class 210—138 see:
Patent No. 3,825,494

3,825,123
INJECTION MOLDING FILTER
Gordon E. Neuman, Coon Rapids, Minn., assignor to A-1 Engineering, Inc., Osseo, Minn.
Filed Aug. 10, 1972, Ser. No. 279,680
Int. Cl. B01d *25/16*
U.S. Cl. 210—232 **19 Claims**



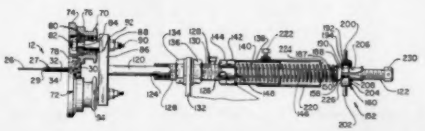
Apparatus for filtering hot running plastic in an injection molding process. The filtering apparatus includes a housing defining a chamber with an inlet and outlet. A thick walled tubular member is disposed in the chamber to define concentric fluid passages respectively communicating with the inlet and outlet. The tubular member has a plurality of elongated openings formed therethrough in parallel, spaced relation which establish fluid communication between the concentric passages. A plurality of removable insert bars are disposed in the outer concentric passage and held in place between the chamber wall and the tubular member. Each insert bar cooperates with an elongated opening to define therewith a plurality of slotted filter passages through which the plastic is forced before injection into a mold.

3,825,124
FILTER ELEMENTS FOR CONTINUOUS FILTERS
Steven S. Davis, Bountiful, Utah, assignor to Envirotech Corporation, Salt Lake City, Utah
Filed July 27, 1970, Ser. No. 275,513
Int. Cl. B01d *33/34, 33/02*
U.S. Cl. 210—330 **9 Claims**



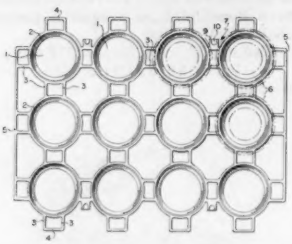
A plurality of concave filtering elements are fixed about the periphery of a rotary filter drum so that the mouths of the elements are open and the closed ends of the elements are directed substantially radially inward of the drum. As the drum rotates in submergence in a slurry, solids are collected in the elements by applying suction to the elements to draw the liquid therethrough; to discharge the collected solids, the elements are everted by reversing the pressure thereon.

3,825,125
FILTER AND GUIDE APPARATUS
C. Lynn Peterson, Salt Lake City, and Jesard Morrise, Roy, both of Utah, assignors to Peterson Filters and Engineering Company, Salt Lake City, Utah
Filed May 24, 1972, Ser. No. 256,281
Int. Cl. B01d *33/14*
U.S. Cl. 210—401 **17 Claims**



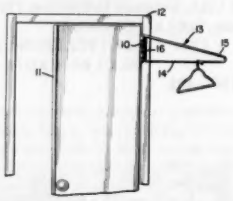
There is herein disclosed a movable cloth filter belt construction for filter apparatus comprising a guide element having a bifurcated cloth gripping portion within which a cloth filter is fastened and a roller engaging portion having an inclined roller engaging surface facing the cloth filter. Flanged roller apparatus engages the inclined surface on the guide element to transversely alignably guide the filter belt during movement and is associated with resilient biasing spring means including detent-type release means which permits disassociation of the spring means and the roller apparatus under high stress conditions.

3,825,126
FLOWER POT GRATE-TRAY
Siegfried Pohl, Niederkassel-Rheidt, and Gunther Nothen, Provinzialstr. 98, Niederkassel-Mondorf, both of Germany, assignors to said Nothen, by said Pohl
Filed Mar. 15, 1972, Ser. No. 234,720
Claims priority, application Germany, Mar. 19, 1971, 2113499
Int. Cl. A47g 7/02
U.S. Cl. 211—71 3 Claims



A symmetrical grate-like flower pot pallet or tray molded from impact resistant plastic providing rows and columns of equi-spaced downwardly convergent pot-receiving rings connected to each other and to hand-grip end bars by paired parallel struts; support legs shaped and externally vertically channelled to receive and be received by legs of like trays for nesting when empty; the end bars and strut-like end-joined paired lateral projections on the rings along the other two sides affording abutments for adjacent trays maintaining an ordered arrangement in a horizontal tray array.

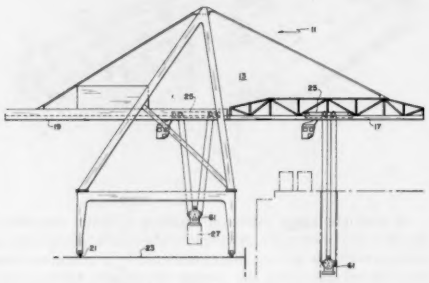
3,825,127
HINGE HANGER
Robert A. Morrison, La Canada, Calif., and John E. Wagner, 1041 E. Green St., Suite 202, Glendale, Calif. 91106
Filed Nov. 17, 1971, Ser. No. 199,553
Int. Cl. A47f 5/08
U.S. Cl. 211—96 4 Claims



A hanger for hanging a variety of household or office articles designed to be secured to the upper hinge of any hinge-supported door.

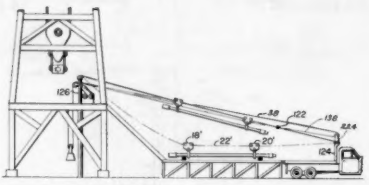
A device is preferably metal rod formed with a horizontal portion designed to act as a support for either hangers or objects of any type. The device includes a support portion secured to the horizontal portion which terminates in a vertical extending pin portion. The pin portion has approximately the same dimensions as a conventional hinge pin. In one embodiment, the pin portion is substituted for the hinge pin in the door. In another embodiment, a bracket is designed to engage the top and bottom of the hinge pin and the pin portion of the hanger engages the bracket. In both embodiments, the hanger swings freely independent of the door and automatically folds behind the door when it is opened.

3,825,128
SWAY-ARREST SYSTEM
George W. Cooper, San Leandro, Calif., assignor to Fruehauf Corporation, Detroit, Mich.
Filed Aug. 23, 1971, Ser. No. 173,869
Int. Cl. B66c 17/20
U.S. Cl. 212—15 7 Claims



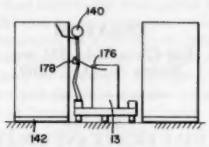
A sway-arrest suspension system for a gantry crane, including a trolley having a plurality of sheaves mounted in a pair of movable sheave heads held within the trolley. The sheave heads move over the same set of rails on which the trolley moves and support a load engaging means by reeving which is acted upon by sheaves held in the load engaging means to arrest sway of the load.

3,825,129
PIPE HANDLING APPARATUS
Don D. Beck, 3203 Eastover, Box 1369, Odessa, Tex. 79760
Continuation-in-part of Ser. No. 17,768, March 9, 1970. This application Aug. 31, 1971, Ser. No. 176,478
Int. Cl. E21b 19/00
U.S. Cl. 214—2.5 13 Claims



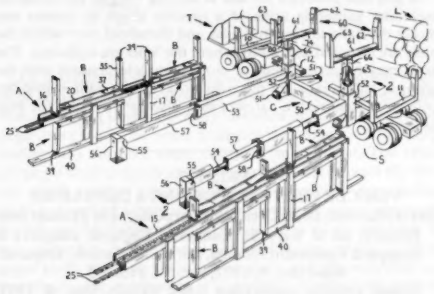
Pipe handling apparatus for transporting pipe between a derrick floor and a pipe rack by a cable-way. A portion of the cable overhangs the derrick floor and the pipe rack and slidably supports pipe receiving carriages which are provided with means for being moved from a location adjacent to the derrick floor to a location which overhangs the pipe rack. One of the carriages include a swingable bulkhead which is opened upon the carriage arriving at the derrick floor. The tension of the cable is controlled to enable the pipe receiving carriages to be vertically positioned with respect to the pipe rack.

3,825,130
MATERIAL HANDLING SYSTEM
Sidney D. Lapham, 2324 Tice Creek Dr. Manor No. 3, Walnut Creek, Calif. 94529
Filed June 26, 1972, Ser. No. 266,219
Int. Cl. B65g *1/04*
U.S. Cl. 214—16 B 5 Claims



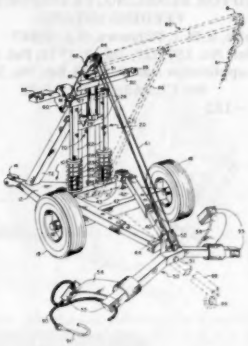
A dispensary type warehousing system featuring palletizing vehicle providing a mobile platform work station, together with pick aisles sufficiently narrow so that all merchandise to be picked is within the picker's reach without the need for leaving the vehicle. The invention makes it unnecessary for the picker to dismount from the mobile platform to perform his task, and this in turn permits partial automation of the vehicle control equipment as shown.

3,825,131
MULTIPLE LOAD STORAGE AND TRANSFER APPARATUS
Dossie M. Batson, 1503 N. Hayden Dr., No. 35, Portland, Oreg. 97217
Filed Dec. 20, 1972, Ser. No. 316,846
Int. Cl. B65g *67/12*
U.S. Cl. 214—38 C 11 Claims



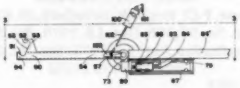
A storage deck is equipped with a plurality of bunks connected to endless chains for receiving and storing preformed loads such as logs. These bunks are movable toward or away from a vehicle station beyond one end of the deck. A transfer carriage has vertically movable bunks to lift a load off the deck bunks and extend the load over a truck such as a log truck. Then the carriage lowers the load onto the truck and retracts clear of the truck, allowing the truck to depart with its load. The apparatus remains in readiness to transfer the next load to another empty truck as soon as one becomes available. In the meantime, other deck bunks are being filled with loads to keep a supply of the preformed loads on hand so that loads are always available when an empty truck arrives without causing any delay in the trucking operations and without any delay in the load preforming operations. The apparatus is also operable in reverse sequence to store loads received from trucks.

3,825,132
TOWING AND LIFTING APPARATUS
Michele Colangelo, c/o World Wide Real Estate Investment Center, 908 Salem St., Revere, Mass. 02148
Filed May 11, 1973, Ser. No. 359,318
Int. Cl. B60p *3/12*
U.S. Cl. 214—86 A 10 Claims



Towing of a disabled passenger car or like tow load by another passenger car at turnpike speeds is facilitated by an apparatus comprising a towable wheeled platform, a vertical shock isolator mounted on the platform and a steering yoke mounted on the vertical isolator. A pivotal lift and a motor drive therefor are mounted on the platform and the lift engages the end of the vehicle to be towed and lifts it up and over the wheel of the towing apparatus and is then locked to the above-described yoke to ready the disabled vehicle for towing. The apparatus is convertible to a yard crane by the addition of a pivotal boom and related components.

3,825,133
PIVOTABLE REFUSE CART DUMPING APPARATUS WITH HORIZONTALLY MOVABLE AND SPREADABLE ARMS
Thomas G. Owen, Jr., R.R. 7 Box 250, Bloomington, Ind. 47401
Division of Ser. No. 203,815, Dec. 1, 1971, Pat. No. 3,790,011.
This application Dec. 26, 1972, Ser. No. 318,221
Int. Cl. B66c *23/00*
U.S. Cl. 214—148 1 Claim



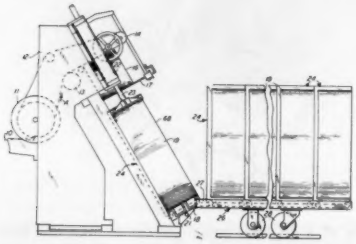
A dumping apparatus having a pair of arms mounted to a truck for engaging a refuse cart. The arms are pivotally mounted to a beam which is slidable horizontally to and from the truck by a cylinder motor. The beam is mounted to a pair of channels which are slidably mounted to a second pair of channels fixedly attached to the truck. The cylinder motor is attached to the truck and has a piston rod connected to the beam. A second cylinder motor mounted to the truck has an extendable piston rod connected to a lever which is fixedly connected to a shaft upon which the arms are hingedly mounted. A pair of cam plates mounted to the truck receive cam followers rotatably mounted to the arms which are urged against the cam plates by a pair of springs. The cam plates diverge and extend beneath the arms thereby allowing the

arms to spread apart as they are pivoted downward past the horizontal position. A pair of slotted hands are mounted to the ends of the arms for receiving handles mounted to the refuse cart. The handles are slidable through the slots so as to achieve a shaking motion of the cart.

3,825,134
METHOD FOR BUNDLING, TRANSPORTING, AND FEEDING SHEETS

Anton R. Stobb, R.D. 1, Pittstown, N.J. 08867

Division of Ser. No. 159,329, July 2, 1971, Pat. No. 3,739,924.
This application Apr. 9, 1973, Ser. No. 348,976
Int. Cl. B65g *57/03, 59/08*
U.S. Cl. 214—152 **3 Claims**

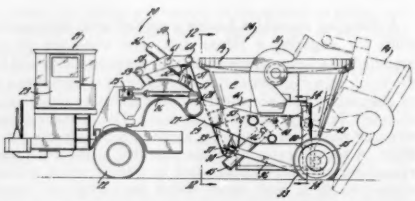


Method for bundling, transporting, and feeding sheets of paper which are preferably in a folded or signature form to be assembled and form a magazine, book, or the like. The sheets are handled by a delivery device, such as a folding machine, and are placed into discrete stacks which are subjected to a compressing device. The stack is formed at an inclined angle and a clamp is applied to the compressed stack. The clamp is shown to have rollers which permit the clamped stack to be wheeled to a transport device such as a cart which is shown. The cart with a plurality of the clamped stacks is then moved to a feeding device which receives the clamped stack in an inclined attitude, and the clamp is removed from the sheets and the sheets are then singly fed into the feeding device which causes the sheets to be collated into an assembled magazine or book. The clamp is shown to be of two extendable and contractable pieces which have a self-locking device for holding the clamp in the contracted position when it is clamping the sheets, and the locking device is releasable when the stack is released in the feeding device.

3,825,135
SLAG POT CARRIER

Edward S. Kress, P.O. Box 368, Brimfield, Ill. 61517

Division of Ser. No. 98,306, Dec. 15, 1970, Pat. No. 3,722,874.
This application Aug. 22, 1972, Ser. No. 282,728
Int. Cl. B65b *21/02*
U.S. Cl. 214—313 **4 Claims**



An improved slag pot load carrier is provided. Fluid powered means are included to assist the primary dump mechanism in moving a vehicle load pivoted on the main vehicle frame from a carry to a dump position, and to return the load to its carry position. Suspension means are provided to lower and raise at least a portion of the vehicle frame and to resiliently support the frame against shocks. A hydro-pneumatic system is also provided to appropriately actuate the suspension means, and the primary dump and return assist mechanisms.

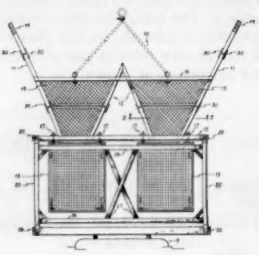
ERRATUM

For Class 214—331 see:
Patent No. 3,825,869

3,825,136
GOLF BALL PICKER AND COLLECTOR

Cecil D. Rettedal, 2700 S. Lincoln, Sioux Falls, S. Dak. 57103

Filed Sept. 18, 1972, Ser. No. 290,176
Int. Cl. B60p *1/00*
U.S. Cl. 214—350 **1 Claim**

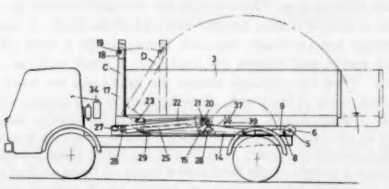


A golf ball collector for use at driving ranges; the collector including gathering arms of a specific shape to collect and direct the balls to a central area and threshold over which the balls are directed into a box where the balls are collected. The arms may be articulated for more complete contact with the ground, and means are provided to keep the balls within the collector. Removable carriers may also be provided for easy unloading.

3,825,137
VEHICLE FOR TRANSPORTING A CONTAINER

David Mackrill; Denis Cecil John Carpenter, and Michael John Howard, all of Bury St. Edmunds, England, assignors to Sheppard Equipment Limited, Barnham, Norfolk, England

Filed Dec. 7, 1972, Ser. No. 313,165
Claims priority, application Great Britain, Dec. 8, 1971, 57034/71
Int. Cl. B60p *1/64*
U.S. Cl. 214—515 **18 Claims**



A vehicle for loading, unloading and tipping a container comprises a first frame pivoted at the rear of the vehicle on a

bedframe, and extending (normally) forwardly from the pivot underneath the container when loaded, a second frame or second members pivoted to the first frame and extending forwardly thereof under the container, an L-shaped third member having the outer end of its horizontal limb pivoted to the second frame members underneath the container and its upright limb provided with at least one hook to attach to the container, with the upright limb in front of the container, two tie-rods-cum-struts pivoted at their front ends to the upright limb and at their rear ends to the rear end of a hydraulic ram, the front end of the ram being connected to the bedframe, the ram also being connected with the second frame or members, so that the one ram can both pivot the third member relative to the second frame or members and also pivot the second frame or members and the third member as one unit relative to the first frame or (when the second frame or members and the first frame are in fixed relationship due to engagement with the container) pivot the first frame, second frame or members, third member and container as one unit relative to the bedframe for tipping.

3,825,138

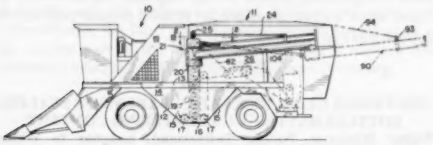
UNLOADER FOR THE GRAIN BIN OF A COMBINE

Stuart D. Pool, Crystal Lake, Ill., assignor to Bernard C. Mathews, Crystal Lake, Ill.

This application Oct. 24, 1972, Ser. No. 299,825

Int. Cl. B60p *1/42*

U.S. Cl. 214—522 **10 Claims**



An unloader for the grain bin of a combine comprises a vertical auger conveyor extending upwardly from the grain bin, and a swinging boom assembly mounted on top of the vertical auger conveyor. The boom assembly including a substantially horizontally disposed auger conveyor and a turret. The vertical auger shaft extends upwardly through and beyond the turret which overlies the vertical auger conveyor. A propeller shaft is disposed externally of the horizontal auger conveyor for driving the horizontal auger shaft from its remote end. A gear assembly located above the turret connects the vertical auger shaft, the external propeller shaft, and a power shaft so that the driving mechanism is located externally of the path of the grain flow through the two conveyors. An additional extension auger conveyor is provided for loading a trailer.

3,825,139

MEANS FOR LOCKING FORKLIFT TRUCK FORKS IN STORED POSITION

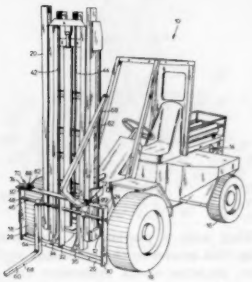
Warren P. Geis, Port Washington, Wis., assignor to Koehring Company, Milwaukee, Wis.

Filed June 11, 1973, Ser. No. 368,817

Int. Cl. B66f *9/14*

U.S. Cl. 214—731 **15 Claims**

A forklift truck comprises an upright mast on which a vertically movable carriage or grill is mounted. A pair of load handling forks are mounted on a horizontally disposed shaft on the grill. Each fork is laterally slidable on the shaft to achieve desired spacing between the forks. Each fork is also vertically pivotable between an in-use position wherein the fork tine extends outwardly of the truck and a stored position wherein the fork tine extends inwardly of the truck and adjacent a side of the mast. Locking means are provided to maintain the forks in stored position and to prevent lateral displacement of the forks on the shaft while stored. The locking means for each fork comprise a generally L-shaped locking bracket which is pivotably attached to the grill and swingable horizontally from a stored position clear of the fork to a locking position in engagement with the fork. The locking means for each fork



further comprise pin means releasably engageable with the bracket and the grill to maintain the bracket in stored or locking position. In one embodiment of the invention the locking bracket is positioned so as to entrap the fork against a side of the mast to prevent lateral movement of the stored fork on its shaft. In another embodiment of the invention the locking bracket is provided with a projection engageable with the fork to prevent lateral movement of the stored fork.

3,825,140

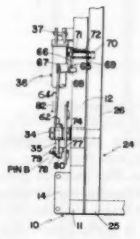
STOOK INVERTOR

Floyd Reid Smith, P.O. Box 154, Hillspring, Alberta, Canada

Continuation-in-part of Ser. No. 112,281, Feb. 3, 1971, Pat. No. 3,716,175. This application Jan. 26, 1973, Ser. No. 326,683

Int. Cl. B65g *7/00*

U.S. Cl. 214—768 **6 Claims**



A triangular stook invertor for picking up a stook consisting of a plurality of bales in triangular formation, and the invertor turns the stook upside down so that it will nest between two adjacent, normally positioned stooks thus enabling a relatively large stook to be built.

3,825,141

COVERED GLASS BOTTLE OR THE LIKE

Edward R. Campagna, Horseheads, N.Y., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed July 13, 1971, Ser. No. 162,103

Int. Cl. B65d *23/08*

U.S. Cl. 215—1 C **6 Claims**

A container comprising an inner glass receptacle and a closely adhering, but not chemically bound exterior protective

sheath substantially covering said receptacle. The exterior protective is comprised of a shape-retaining, preferably thermoplastic resin adapted to restrain and retain glass fragments should the glass receptacle become broken. The sheath is

further provided with a plurality of outwardly protruding nodular means that minimize the container surface frictional characteristics, increase shock resistance and provide maximum non-slip characteristics to the sheath when the container is hand-held.

3,825,142

THERMOPLASTIC SHIELDED GLASS BOTTLE

Edward R. Campagna, Horseheads, N.Y., assignor to Dart Industries Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 162,103, July 13, 1971. This application Mar. 7, 1972, Ser. No. 232,412

Int. Cl. B65d *23/08*

U.S. Cl. 215—1 C **3 Claims**

A container comprising an inner glass receptacle and a closely adhereing exterior protective sheath substantially covering said receptacle. The exterior protective is comprised of a shape-retaining, preferably thermoplastic resin adapted to restrain and retain glass fragments should the glass receptacle be broken. The sheath is further provided with a plurality of outwardly protruding nodular means that lend a roughened appearance to the sheath surface and which produce a surface elevation variance from the mean thickness of the sheath by between about 6 and 60 percent. This surface characteristic minimizes the container surface frictional resistance, increases shock resistance and provides maximum non-slip characteristics to the sheath when the container is hand-held.

3,825,143

CHILDPROOF MEDICINE VIAL

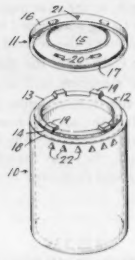
Randall K. Julian, Elberfeld, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Nov. 8, 1972, Ser. No. 304,630

Int. Cl. B65d *55/02*

U.S. Cl. 215—9 **3 Claims**

A childproof medicine vial or the like. The vial consists of a container having a circular neck with an undercut annular groove in its outer side. A domed circular cap for the container has an annular rim extending around the container neck. The rim has an inwardly extending lip adapted to snap into the groove for retaining the cap on the container. There are a plurality of axially extending abutments on the container neck and the same number of downwardly extending lugs are formed on the inner surface of the cap. The series of abutments and the series of lugs lie in axially aligned circles. Both



the abutments and the lugs are spaced unevenly but identically around the circles so that they are axially aligned in only one relative position of the cap and the container. When the abutments and lugs are aligned, depression of the center of the domed cap engages the abutments and lugs and spreads the cap rim to disengage the lip from the groove in the container neck. Cooperating indicia on the cap and the container indicate when the two are in proper relative angular positions so that the vial can be opened.

3,825,144

CONTAINER CLOSURE PARTICULARLY FOR SEALING BOTTLES HAVING A GAS EMITTING CONTENT

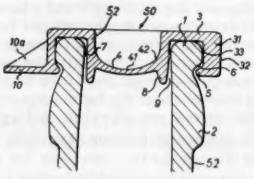
Walter Wiedmer, Nafels, Switzerland, assignor to Walter Wiedmer Plastikform, Nafels, Switzerland

Filed Oct. 16, 1972, Ser. No. 297,836

Claims priority, application Switzerland, Oct. 26, 1971, 15566/71

Int. Cl. B65d *41/18*

U.S. Cl. 215—41 **6 Claims**

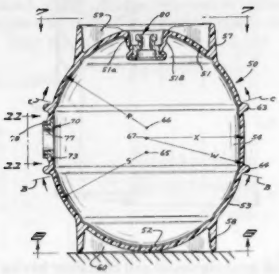


A container closure particularly for sealing bottles which have gas contents comprises a sealing member having a deformable disc portion which engages into the bottle neck and which has a side wall with a sealing lip engaged against the interior of the neck wall and a centering lip portion which is connected to the lower end of the disc and extends into the bottle neck. A holding element portion is connected to the opposite end of the wall of the disc portion from the centering lip and it extends over the annular mouth bead or rim of the container and terminates in a skirt portion on the exterior extending around the bead and includes an inturned bottom portion which engages the bead from the exterior. The holding element portion carries a tab which projects outwardly from one side and the material of the sealing member increases in thickness substantially from the center of the disc member toward the end which is opposite to the tab end.

3,825,145
BEER KEG

Richard W. Reynolds, Burnsville, Minn., assignor to Huck Finn, Inc., Spring Lake Park, Minn.

Continuation-in-part of Ser. No. 217,306, Jan. 12, 1972, which is a continuation-in-part of Ser. No. 58,341, July 27, 1970, abandoned. This application Oct. 18, 1972, Ser. No. 298,469
Int. Cl. B65d 1/20
U.S. Cl. 220—1 R 14 Claims

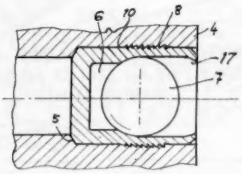


A beer keg having the top, bottom and side walls made of plastic, and tapper and filler plug mounting members made of plastic or metal which in one embodiment are cast in position as the top and side walls are formed. In the second and third embodiments, the filler plug mounting member is retained in the central part of the keg mold as the keg is molded and thereafter mounted in a filler opening formed in the keg.

3,825,146
METHOD FOR CLOSING BORES AT WORKPIECES AND IMPROVED PLUG CONSTRUCTIONS FOR THE PERFORMANCE OF THE AFORESAID METHOD

Georg Hirmann, Zurich, Switzerland, assignor to Dr. Ing. Koenig AG, Dietikon, Switzerland

Filed July 6, 1971, Ser. No. 159,647
Int. Cl. B65d 39/12
U.S. Cl. 220—24.5 12 Claims

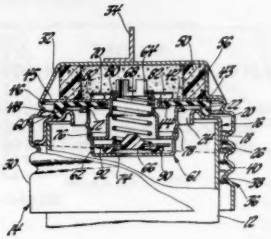


A plug for closing the bores of workpieces as well as a method for closing such bores wherein there is provided a plug sleeve which is inserted into the bore of the workpiece. An expanding member is driven into the bore of the plug sleeve for progressively radially expanding the plug in the axial direction thereof. This causes anchoring means at the outside surface of the sleeve to fixedly engage with the material of the wall of the bore of the workpiece. The expanding member should possess a substantially ball-like configuration at least at the region intended to bear against the bore of the plug sleeve. This expanding member may be preferably in the form of a ball.

3,825,147
FILLER CAP

Harold W. Noponen, Flint, and Tom B. Miller, Grand Blanc, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 10, 1972, Ser. No. 296,039
Int. Cl. B65d 51/16
U.S. Cl. 220—44 A 1 Claim

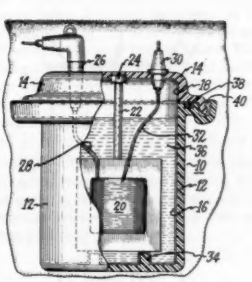


A filler cap for a motor vehicle fuel tank has a rolled thread engageable with a helical lip on the fuel tank filler neck and includes pressure and vacuum relief valves, and a relief valve filter.

3,825,148
HERMETIC SEALING SYSTEM FOR PLASTIC TANK AND COVER

Richard F. Hunter, Hickory, N.C., and Robert B. Truitt, West Lafayette, Ind., assignors to General Electric Company, Schenectady, N.Y.

Filed Sept. 25, 1972, Ser. No. 291,728
Int. Cl. H01f 27/02; H05k 5/06; B65d 53/06
U.S. Cl. 220—46 R 1 Claim

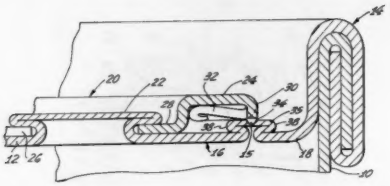


An hermetic sealing system for plastic tanks and covers. A plastic tank has a flat surface on the upper edge of its wall, such surface having a first groove formed therein. A lip portion extends from the flat surface and has a second groove therein. A flexible gasket is mounted in the first groove extending above the flat surface. A cover member rests on the flat surface compressing the flexible gasket and has an extending edge portion which fits into the second groove. An epoxy material is poured into the second groove and cured thus sealing the cover to the tank.

3,825,149
EASY OPENING CONTAINER HAVING SHOULDERS TO SAFEGUARD ALL SEVERED EDGES

Omar L. Brown, and James R. Schubert, both of Dayton, Ohio, assignors to Ermal C. Fraze, Dayton, Ohio

Filed Dec. 6, 1972, Ser. No. 312,700
Int. Cl. B65d 17/20
U.S. Cl. 220—54 18 Claims

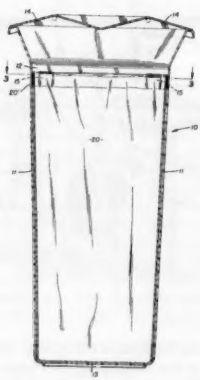


The sheet material of the container wall is offset to form a channel that conforms to the periphery of the tear portion of the wall. The channel has longitudinal side walls connected by a transverse web and a score groove defining the tear portion is formed in the web centrally thereof. The two longitudinal walls of the channel are in the form of two rounded shoulders to safeguard respectively the sharp edge of the severed tear portion of the container and the corresponding sharp severed edge of the remaining fixed portion of the container wall.

3,825,150
WASTE RECEPTACLE HAVING LINER BAG HOLDERS

William D. Taylor, Wooster, Ohio, assignor to Rubbermaid Sales Corp., Wooster, Ohio

Filed Aug. 23, 1972, Ser. No. 283,218
Int. Cl. B65d 25/14
U.S. Cl. 220—63 R 2 Claims

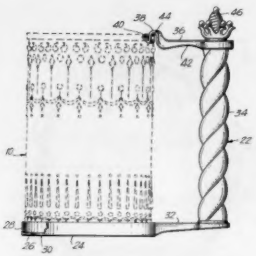


A molded waste receptacle having integral resilient tabs formed in its side walls and adapted to be sprung inwardly by pressing on their exterior surfaces for engaging under and pinching the periphery of a liner bag between the tabs and the adjacent receptacle wall.

3,825,151
CONTAINER AND DETACHABLE HANDLE STRUCTURE THEREFOR

Fabian Arnaud, Reforma No. 1755, Mexico City, Mexico

Continuation-in-part of Ser. No. 251,072, May 8, 1972. This application Dec. 1, 1972, Ser. No. 311,440
Int. Cl. B65d 25/28
U.S. Cl. 220—94 R 12 Claims

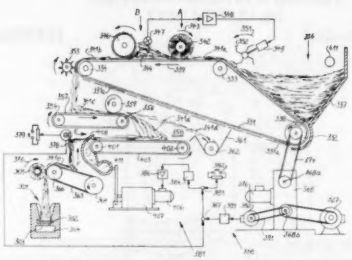


A combined drinking vessel and container having a recessed upper closure which upon removal provides a container rim structure suitable for drinking purposes. A detachable handle having a lower container-supporting flange and an upper clamping member fastened to the ends of a gripping handle is adapted to engage the lower and upper portions of the container so as to form a mug-type arrangement therewith.

3,825,152
METHOD AND APPARATUS FOR MEASURING THE RATE OF FEED OF FIBROUS MATERIAL

Harry Davis, Hamburg, and Willy Rudszinat, Dassendorf, both of Germany, assignors to Hauni-Werke Koerber & Co. KG, Hamburg, Germany

Filed July 17, 1972, Ser. No. 272,630
Claims priority, application Great Britain, July 20, 1971, 34043/71; Nov. 9, 1971, 51993/71
Int. Cl. G01f 1/00
U.S. Cl. 222—1 19 Claims



A distributor for tobacco shreds in a cigarette rod making machine employs a system of conveyors which transport a continuous wide layer of tobacco shreds from a magazine toward a channel wherein the shreds form a narrow tobacco stream. A pivotable baffle extends across the path of the layer and a rotary brush or a rapidly moving endless apron propels the shreds of successive increments of the layer at a constant speed against the baffle whereby a potentiometer whose sliding contact shares the movement of the baffle produces signals whose intensity varies as a function of changes in the quantity of shreds per unit length of the layer. The thus obtained signals are used to change the rate of withdrawal of tobacco shreds

from the magazine or to intercept a larger or smaller percentage of shreds which are being propelled toward the baffle. The main prime mover of the cigarette rod making machine can be operated at several speeds, and a compensating circuit is provided to prevent the potentiometer from changing the rate of tobacco feed into the channel in response to changes in operating speed of the prime mover.

3,825,153

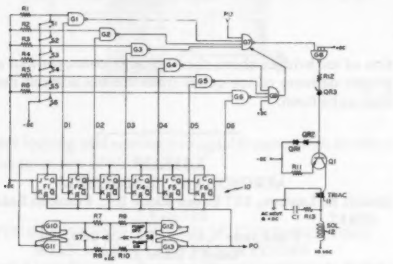
SOLID STATE AUTOMATIC FLUID DISPENSING MEANS

Bruce R. Patrick, Stow, Ohio, and Herbert W. Timms, Tucson, Ariz., assignors to Herbert W. Timms, Tucson, Ariz.

Filed Feb. 22, 1973, Ser. No. 334,635

Int. Cl. B67d *5/30*

U.S. Cl. 222—14 **5 Claims**



A unique solid state control circuit is disclosed whereby a preselected volume of fluid may be automatically dispensed. Fundamentally, the invention comprises a plurality of selection switches, each of which is associated with a particular volume of fluid. A sequential logic circuit indicates the actual volume of fluid which has been dispensed. A logic network compares the states of the selection switches with the output of the sequential logic circuit so as to determine when the volume of fluid actually dispensed equals the preselected volume indicated by the selection switches. When equivalency occurs the logic network indicates the same to a current source transistor which in turn, through a triac, controls the solenoid pump valve through which the fluid is being dispensed. The circuit disclosed is adaptable for use in presently existing gasoline pumps and is designed with specific considerations given to the ambient conditions in which the circuit must operate.

3,825,154

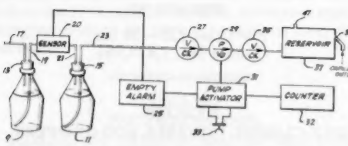
FLUID DISPENSING SYSTEM

Wilbert J. Jaeger, 1582 Sim Pl., Anaheim, Calif. 92802

Filed Jan. 17, 1972, Ser. No. 218,333

Int. Cl. B67d *5/44*

U.S. Cl. 222—136 **7 Claims**



A multiplicity of fluid conducting stoppers are inserted into and seal the open mouths of a plurality of containers. Each fluid conducting stopper has a first and second conduit communicating with the interior of the container into which it is inserted. The multiplicity of fluid conducting stoppers and containers are connected in tandem by attaching the second conduit of one to the first conduit of another. A variable displacement diaphragm pump with check valves is attached to the first conduit of the first fluid conducting stopper in the series of tandem connected stoppers and containers for removing the fluid product from the containers. The output of the pump is connected to a dispensing outlet from which fluid is dispensed by force of gravity when the fluid level rises above the outlet in response to the pumping action of the diaphragm pump. A plurality of individual modular systems of tandem containers and pumps can be utilized to simultaneously dispense a variety of fluids.

3,825,155

APPARATUS FOR THE INJECTION OF PLASTIC MATERIALS

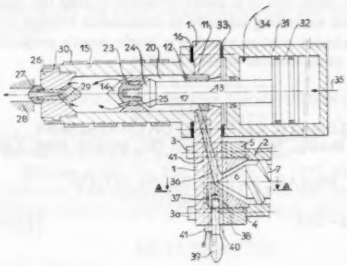
Gabriel Morault, 9 allee Turenne, Nantes 44, France

Filed May 18, 1972, Ser. No. 254,385

Claims priority, application France, May 21, 1971, 71.20032

Int. Cl. B67d *5/62*

U.S. Cl. 222—146 HE **4 Claims**



The invention is an apparatus for the injection of pasty materials such as thermoplastic materials, the apparatus including an injection cylinder formed with a material-receiving chamber and an extruder having an outlet face defining an outlet opening for the material. A connecting transfer plate is secured to the injection cylinder in a manner to extend laterally of the cylinder. It is also mounted on the extruding device for pivotal action of the latter about an axis extending laterally of the axis of the injection cylinder. The pivotal action is between an open position wherein the outlet face of the extruder stands free of one face of the transfer plate and a closed position wherein the said one face of the transfer plate stands flat against the outlet face of the extruder. The transfer plate is secured in releasable manner in closed position and has a communication channel for the flow of pasty materials, the channel extending from the outlet opening of the extruder outlet face and opening into the material receiving chamber whereby it becomes accessible for inspection when the apparatus is in open position.

3,825,156

AUTOMATIC LIQUID POURING DEVICE FOR VACUUM BOTTLE

Shirae Nobuo, Nishinomiya, Japan, assignor to Tiger Vacuum Bottle Industrial Company, Limited, Osaka Pref., Japan

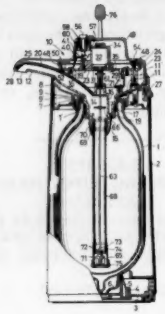
Filed Feb. 13, 1973, Ser. No. 332,092

Int. Cl. B67d *5/48*

U.S. Cl. 222—183 **6 Claims**

An automatic liquid contents pouring device for a vacuum bottom. The lid of the bottle is in part formed into a holder containing a motor, dry cells, circuits and a switch related therewith. The lid forms a plug cylinder portion in the center of a bottom bottle member formed integrally with the holder.

A propeller shaft having a motor-driven propeller at the lower end extends longitudinally through a liquid feed pipe joined to the plug cylinder portion and extending downwardly of the



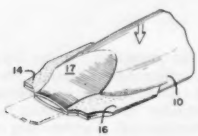
bottle. The other end of a gutter designed to lead the liquid contents and extending laterally in continuous relation with the plug cylinder portion reaches a bottle mouth projecting from a part of the bottom bottle member.

3,825,157

AUTOMATIC CLOSURE FOR CONTAINERS

Albert M. Herzig, 700 N. Rexford Dr., Beverly Hills, Calif. 90212

Filed Aug. 10, 1973, Ser. No. 387,470
Int. Cl. B65d *1/32*
U.S. Cl. 222—212 **7 Claims**



This invention is an improved automatic closure for squeeze bottles or the like, tubes, or containers of the type formed from flexible or semi-rigid, flexible material such as polyethylene or semi-rigid polyvinyl chloride having properties of resilient flexibility. The container is provided with a preferably tapered neck portion terminating in end lips which form an openable closure which is elongated. The material adjacent one or both of these lips is preferably formed with a deformation or set so that when portions of tapered side edges are sealed together, they provide the closure which is opened by pressure digitally exerted on the container and closes on release of pressure.

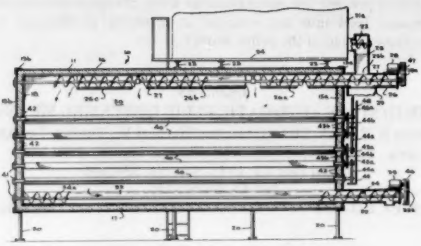
3,825,158

CUBE ICE STORAGE BIN WITH DISTURBER BARS

William F. Morris, Jr., 801 Fayetteville St., Raleigh, N.C. 27601

Filed May 16, 1973, Ser. No. 360,951
Int. Cl. F25c *5/18*
U.S. Cl. 222—238 **9 Claims**

Ice cube storage apparatus in the form of a storage bin having a feed screw conveyor near the top thereof for delivering ice cubes into the bin, an inclined bottom wall, a discharge conveyor screw and trough adjacent the lowermost part of the inclined bottom for withdrawing the cube ice from the bin, and a plurality of rotatable disturber bars at plural vertically spaced levels above the discharge conveyor to prevent forma-



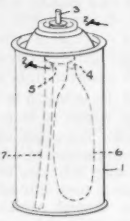
tion of ice bridges above the discharge conveyor and assist in proper delivery of ice cubes from the bin without damaging their cube form.

3,825,159

AEROSOL VALVE ASSEMBLY

Robert H. Lanuwe, 237 Green Ridge Rd., Franklin Lakes, N.J. 07417

Filed June 7, 1972, Ser. No. 260,460
Int. Cl. B65d *83/14*
U.S. Cl. 222—402.24 **6 Claims**



An aerosol valve assembly has a valve which is pressure biased to a normally closed position, the valve being opened by an operator actuated by the application of manual force, and the assembly including a means for applying a resistance to movement of the valve when the operator receives an initial application of manual force and which releases said resistance with an increase in this force so that this increased force causes the valve to open with a snap action.

ERRATUM

For Class 223—30 see:
Patent No. 3,824,964

3,825,160

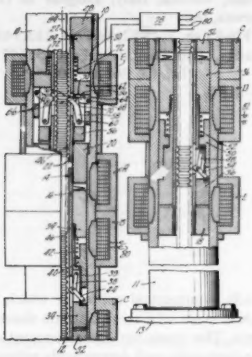
SELF-CLOSING CONTROL ROD GRIPPERS

Harold V. Lichtenberger, West Simsbury, and Christian W. Ruoss, Enfield, both of Conn., assignors to Combustion Engineering Inc., Windsor, Conn.

Filed Dec. 23, 1971, Ser. No. 211,205
Int. Cl. G03b *1/28*
U.S. Cl. 226—59 **14 Claims**

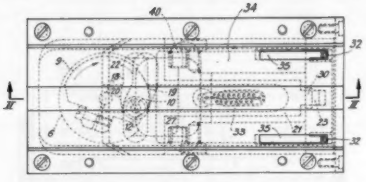
Control mechanism for a nuclear reactor non-scramming control rod including a latch, spring and gravity urged into

latching position, and electromagnetically released and having a spring and gravity actuated over-center toggle locking said



latch and locking said control rod against movement in either direction upon loss of electricity.

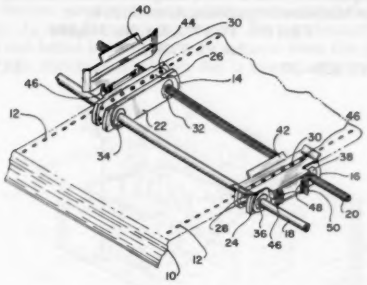
3,825,161
DRIVE DEVICE FOR A FLEXIBLE STRIP PROVIDED WITH MARGINAL PERFORATIONS
Raymond Louis Delorme, Bagnolet, France, assignor to Societe Honeywell Bull (Societe Anonyme), Paris, France
Filed May 29, 1973, Ser. No. 364,226
Int. Cl. G03b 1/22
U.S. Cl. 226—67 **11 Claims**



A device for driving a flexible strip provided with two rows of regularly spaced lateral perforations. This device includes a first slider to which is imparted a first reciprocating movement back and forth parallel to the direction of said strip, a second slider which moves with the first slider as far as the first reciprocating movement is concerned, but to which is also imparted a second reciprocating movement with respect to the first slider, a hinging plate mounted to pivot on the first slider and carrying claws each of which may cooperate with a perforation in one of the said lateral rows, and means enabling the said hinging plate to be moved towards or away from the second slider.

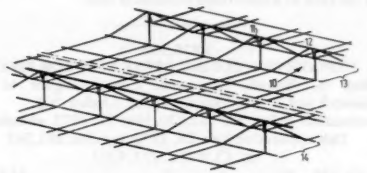
3,825,162
FEED MECHANISM
Leo J. Hubbard, 200 Anchor Dr., Somerset, Mass. 02726
Filed Feb. 20, 1973, Ser. No. 333,816
Int. Cl. G03b 1/30
U.S. Cl. 226—74 **9 Claims**

Mechanisms for feeding documents having perforations along their marginal edges are described. These mechanisms have frames which define linear paths for endless belts made of spring material along the drive path of the document perforations. The frames support the belts for curvilinear motion around and away from the ends of the linear paths. The belts have unitary pin and roller drive elements which extend through perforations in the belt at equidistant intervals



therealong. Sprockets supported by the frame and journalled therein carry the belt around the curvilinear paths. The drive elements and the belts can be molded together into a unitary structure.

3,825,163
APPARATUS FOR THE PRODUCTION OF REINFORCEMENT
Gijsbert Versteeg, Nunspeet near Stationslaan, Netherlands, assignor to Imex AG, Zurich, Switzerland
Division of Ser. No. 226,175, Feb. 14, 1972, Pat. No. 3,748,720. This application May 14, 1973, Ser. No. 359,920
Claims priority, application Switzerland, Feb. 18, 1971, 2378/71
Int. Cl. B23k 37/00
U.S. Cl. 228—5 **10 Claims**

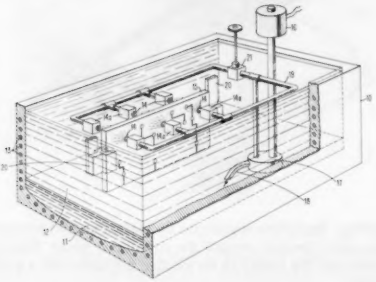


A reinforcement for concrete ceilings, concrete walls and the like is produced by providing first a reinforcing mat from longitudinal reinforcing bars and groupwise disposed transverse reinforcing bars. In one or more spaced rows of meshes of the mat which extend parallel to the longitudinal reinforcing bars, the transverse bars of each group in such mesh rows are bent apart in directions obliquely to the plane of the mat and simultaneously flexed V-wise in such a way that the bent and flexed transverse bars meet each other again groupwise at their flex apexes, so as to form a row of protruding pyramids instead of each of these mesh rows. Thereupon, the summits of the pyramids are interconnected by means of a straight individual bar to form a protruding lattice girder. The apparatus for producing such reinforcement comprises pairwise supporting means to receive and support the reinforcing mat, pairwise securing means cooperating with the supporting means for holding the mat, bending means for simultaneously bending apart and V-wise flexing the transverse bars of a row of meshes, transport means for handling a straight individual bar, and welding means for welding the individual bar to the row of pyramids formed by bending and flexing the transverse bars of a row of meshes.

3,825,164
APPARATUS FOR SOLDERING PRINTED CIRCUIT CARDS

Frank H. Sarnacki, Johnson City, and Robert V. Steenstrup, Binghamton, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 11, 1972, Ser. No. 314,080
Int. Cl. B23k *1/08*
U.S. Cl. 228—37 **8 Claims**

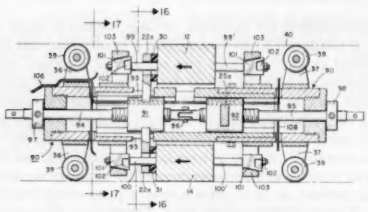


A method and apparatus for soldering component devices to a printed circuit card or board by immersing an assembled printed circuit card into a tank of a controllably heated fluxing composition or bath wherein the assembly is preheated to a suitable temperature. A pumping apparatus is applied to a pool of molten solder residing at the bottom of the tank to cause the solder to flow upwardly through a piping system and exit an orifice or plurality of orifices extending transversely of the direction of movement of the printed circuit card assembly. The solder spray system is immersed in the bath and creates a wall of molten solder which is impinged against the printed circuit card to effectively join the components to the printed circuit card as the card is being uniformly withdrawn from the tank at a controlled movement rate.

3,825,165
EXPLOSIVE WELDING APPARATUS FOR PIPE

William G. Howell, Lakewood, Colo., assignor to Esso Research and Engineering Company, Linden, N.J.

Continuation of Ser. No. 252,820, May 12, 1972, abandoned. This application Aug. 24, 1973, Ser. No. 391,363
Int. Cl. B23k *5/22, 9/02*
U.S. Cl. 228—50 **31 Claims**



An expandable mandrel for explosive welding of pipe is formed of a plurality of opposing pairs of arcuate segmented tapered members slidably arranged on each other and adapted when compressed to form a hollow cylindrical mandrel. Plate members on each end of the mandrel angularly arranged relative to each other have resilient means between the plate members and the mandrel which are compressed to compress the segments. The mandrel is equipped with means for movement through pipe sections.

3,825,166
CONTAINER HAVING AN OPEN TOP SURROUNDED BY A LIP

Pietro Padovani, Verona, Italy, assignor to O.M.V. S.p.A., Parona, Verona, Italy

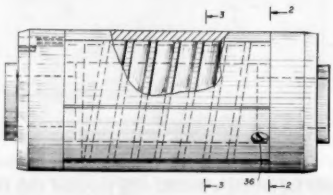
Filed Feb. 7, 1972, Ser. No. 223,945
Claims priority, application Italy, Feb. 13, 1971, 84912/71
Int. Cl. B65d *3/00*
U.S. Cl. 229—1.5 B **1 Claim**

A rotationally symmetrical container which is open at its top and which is made of a thermoplastic sheet material of a given thickness. The container has a constant wall thickness and carries an outwardly and downwardly extending lip at the upper end surrounding and spaced from an upper wall region of the container and defining a continuous uninterrupted groove therewith. This lip has a solid cross section the thickness of which is greater than the thickness of the sheet used for production of the container.

3,825,167
EXPANDING MANDREL OR CHUCK

Anthony J. Komorek, Warren, N.J., and Lawrence R. Damour, 16 Chesler Square, Succasunna, N.J. 07876, assignors to said Damour, by said Komorek

Filed Dec. 26, 1972, Ser. No. 318,519
Int. Cl. B23b *31/40*
U.S. Cl. 279—2 **13 Claims**



This invention pertains to an expanding mandrel or chuck in which air or hydraulic fluid is fed to and into a resilient tube arranged in a helical spiral. This tube is carried by and in grooves formed in a body and when pressurized air is fed into the tube it is expanded in a controlled manner to move three longitudinally disposed and retained jaws outwardly to positively drive a supported member carried on the chuck. In an alternate arrangement the jaws are made smooth to provide a controlled torque shaft which, with fixed retaining collars, provide a differential rewind shaft.

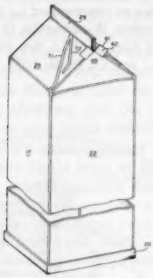
3,825,168
GABLE TOP CONTAINER

George E. MacEwen, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 14, 1970, Ser. No. 28,348
Int. Cl. B65d *5/72*
U.S. Cl. 229—17 G **8 Claims**

A gable top container and blank for forming same. The container includes inclined roof panels which define a gable open-

ing therethrough, and a pair of end closure panels for closing opposite ends of the gable opening. Roof panels of the gable



top structure are provided with novel score line configurations for causing one of the end closure panels to snap outwardly forming a pouring spout.

3,825,169

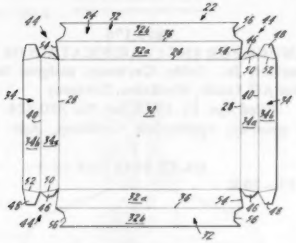
PAPERBOARD CONTAINER AND BLANK THEREFOR

George Leroy Meyers, Menasha, Wis., assignor to American Can Company, Greenwich, Conn.

Filed July 21, 1972, Ser. No. 273,838

Int. Cl. B65d *5/22*

U.S. Cl. 229—34 A **20 Claims**



A paperboard container and blank therefor wherein the container is formed having tapered double thickness side walls and corner configurations wherein superimposed tabs extend from one of two adjacent side walls to adhesively bond to one side of a second adjacent side wall to thereby provide double thickness of material at the corner. One thickness of the second adjacent side wall is cut out co-extensively with the tab next adjacent thereto into which the tab is recessed thereby providing three thicknesses at the overlap of the corner connection.

3,825,170

DOUBLE-BOTTOM, ONE-PIECE BEVERAGE CASE

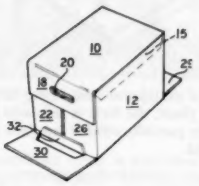
John J. Aust, Toledo, and Charles D. Gray, Sylvania, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 18, 1973, Ser. No. 352,116

Int. Cl. B65d *5/08, 5/46*

U.S. Cl. 229—37 E **2 Claims**

A wrap-around or end-loading style container, adapted to be formed in a typical rectangular, tubular configuration, but with a double thickness cushion bottom, a blank for making same, and a method for folding the blank into the container as disclosed. The design of this invention is unique in that a double thickness bottom with cushioning characteristics is obtained using a blank no larger than a standard blank, thereby giving minimal additional costs. To a typical rectangular container blank with four adjacent top, bottom, and side panels are added end closure flaps at each opposite end of the respective panels. The side panel closure flaps are inwardly folded after the four panels are rectangularly arranged and attached by way of a manufacturer's flap or joint. The top closure flap is glued and folded inwardly and down against these side panel flaps. The bottom panel closure flap is formed with two sections, each foldable along the line connecting the flap to the bottom panel. One of these sections, resembling a manufacturer's tab, is glued and folded inwardly to contact the first-folded side panel flaps, while the second section is glued and reversibly folded to contact the bottom of said container, thereby giving, in conjunction with the similarly folded flap at the opposite end of said bottom panel, a double thickness over a substantial portion of the surface of the bottom of the container for cushioning properties.



3,825,171

CARTONS

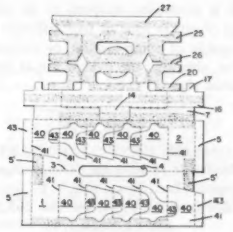
Ernest James Dewhurst, 29 Euphrasia Dr., Toronto, Ontario, Canada

Filed Aug. 15, 1972, Ser. No. 280,896

Claims priority, application Canada, Apr. 18, 1972, 139948

Int. Cl. B65d *5/46*

U.S. Cl. 229—52 A **6 Claims**



The invention relates both to a carton having a plurality of article receiving compartments therein and an extensible carrying handle as well as to a one-piece blank forming an interior divider assembly within the carton and the handle. The handle is formed from various panels and is detachably secured to the remainder of the assembly whilst the transverse partitions, forming part of the latter, have "tits" inhibiting contact between the lower portions of adjacent articles.

3,825,172

TUBULAR FLEXIBLE BAG WITH LAP WELDED ENDS

Carlos A. Mollura, 2824 Del Oro Ln., Fullerton, Calif. 92632

Division of Ser. No. 170,209, Aug. 9, 1971, Pat. No. 3,753,819.

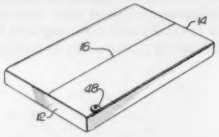
This application Apr. 23, 1973, Ser. No. 353,293

Int. Cl. B65d *3/10, 5/12, 5/16*

U.S. Cl. 229—5.5 **3 Claims**

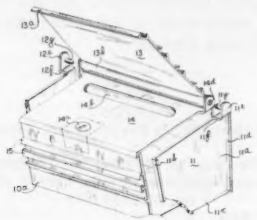
A length of plastic material is rolled to form a tube, the ends being lapped and partially welded to leave an access opening

to the inside of the bag. The bag is then telescoped over welding die or form having the general configuration of the tube, but axially compressed. The tube is then accordion folded about the thin form so that the ends of the tube can be



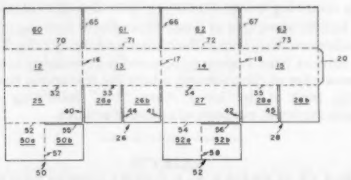
wrapped around peripheral rims of the form. End pieces are then welded in place, the form is removed through the access opening and the partially welded lap joint forming the access opening is sealed.

3,825,173
MAIL BOX
William V. Sunday, 9904 Manor Ave., Cleveland, Ohio 44104
Filed Mar. 26, 1973, Ser. No. 344,912
Int. Cl. A47g *29/12*
U.S. Cl. 232—17 **2 Claims**



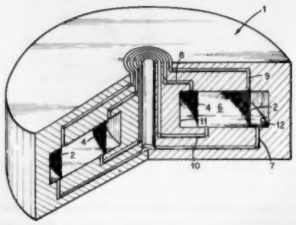
A mail box is presented adapted to be cheaply and efficiently formed of either four or five different elements, each of which is capable of being molded or extruded of synthetic plastic material, although the design would lend itself to construction in metal also.

3,825,174
COMPARTMENTALIZED CARTON
Clarence R. Booth, Jr., Charlotte, N.C., assignor to Continental Can Company, Inc., New York, N.Y.
Filed June 22, 1972, Ser. No. 265,376
Int. Cl. B65d *5/48*
U.S. Cl. 229—28 R **2 Claims**



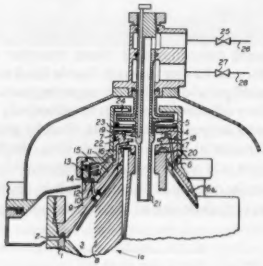
A carton formed of paper or corrugated board having four side walls folded to form a rectangular section with four bottom flaps attached thereto. Two opposing bottom flaps are provided with integral partition panels for dividing the carton into four compartments thereby increasing the carton's stacking strength.

3,825,175
CENTRIFUGAL PARTICLE ELUTRIATOR AND METHOD OF USE
Walter K. Sartory, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.
Filed June 6, 1973, Ser. No. 367,684
Int. Cl. B04b *3/00, 5/06*
U.S. Cl. 233—2 **6 Claims**



A method and apparatus for carrying out centrifugal elutriation using a rotatable cylinder having an annular cavity within. Samples are introduced into the cavity at a central part thereof. A suspending liquid is introduced into the cavity at the centrifugal side. A first portion of particles within the sample moves in the centripetal direction with the flowing liquid and a second portion of larger particles moves in the centrifugal direction. Exit ports at the centripetal and centrifugal sides of the cavity provide a means for continuously removing the separated first and second portions of particles.

3,825,176
CENTRIFUGE FOR THE CLARIFICATION OF LIQUIDS
Heinz Hemfort, Jr., Oelde, Germany, assignor to Westfalia Separator AG, Oelde, Westfalen, Germany
Filed Apr. 11, 1973, Ser. No. 350,224
Claims priority, application Germany, Apr. 27, 1972, 2220718
Int. Cl. B04b *1/18*
U.S. Cl. 233—20 R **5 Claims**



Self-dumping centrifugal separator having a main valve at the periphery of the drum for periodic dumping of solids and a secondary valve for removal of liquid from the separating zone to reduce the discharge of liquid through the main valve during dumping. Means, such as springs, urge the secondary valve into a normally closed position. A control chamber is provided for receiving liquid to urge the secondary valve to the open position and a passageway communicates the control chamber with an annular groove in the drum adjacent the drum axis. The drum includes means for sensing build-up of solids in the solids collecting chamber, including a sensing liquid receiving

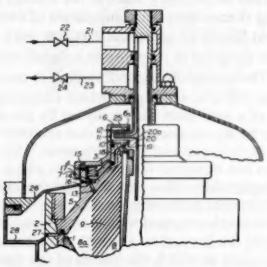
chamber, having a lower lip and an upper lip, in the drum formed as an annular groove about the drum axis, means for delivering sensing fluid to that chamber and means for delivery of sensing fluid from the chamber to the inner boundary of the solids collecting chamber, and a pulse sensing means projecting into that chamber. The control chamber and the sensing liquid receiving chamber are separated by one of the lips of the sensing liquid receiving chamber. The separating lip is of greater inside diameter than the other lip of the sensing liquid receiving chamber, and the pulse responsive means projects into the sensing liquid receiving chamber to a point radially outward of the inside diameter of the separating lip. Upon build up of the liquid level in the sensing liquid receiving chamber, the pulse responsive means is first contacted and then the liquid overflows into the control liquid receiving chamber. Thereby, the control chamber is filled with liquid which forces the control valve to the open position for discharge of liquid from the separating chamber.

3,825,177

SELF-DUMPING DRUM CENTRIFUGE FOR THE CLARIFICATION OF LIQUIDS, EQUIPPED WITH A PARING DISK FOR REMOVING THE CLARIFIED LIQUID UNDER PRESSURE

Werner Kohlstette, and Heinz Hemfort, Jr., both of Oelde, Germany, assignors to Westfalia Separator AG, Oelde/Westfalen, Germany

Filed Apr. 11, 1973, Ser. No. 350,279
Claims priority, application Germany, Apr. 27, 1972, 2220717
Int. Cl. B04b 1/14
U.S. Cl. 233—20 A **3 Claims**



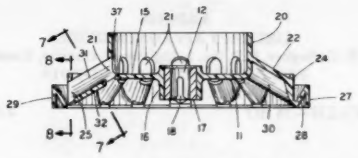
Self dumping centrifugal separator having a paring chamber and disk for removal of clarified liquid, and, for dumping, a main valve at the periphery of the drum for periodic ejection of solids and a secondary valve for removal of liquid from the separating zone to reduce the discharge of liquid through the main valve during dumping. Means, such as springs, urge the secondary valve into a normally closed position. A control chamber is provided for receiving liquid to urge the secondary valve to the open position and a passageway communicates the control chamber with an annular groove separated by a weir from the paring chamber, the weir being of greater inside diameter than the inside diameter of the paring chamber cover. Upon interruption of flow of clarified liquid from the paring disk, during initiation of dumping, liquid in the paring chamber overflows the weir and flows into the annular groove, through said passageway to the control chamber and forces the secondary valve to the open position for discharge of liquid from the separating zone.

3,825,178

CENTRIFUGE ROTOR

Donald E. Burg, Miami, Fla., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Dec. 17, 1971, Ser. No. 209,272
Int. Cl. B04b 9/12
U.S. Cl. 233—26 **17 Claims**



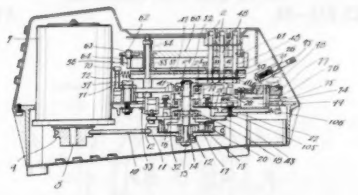
A fixed angle centrifuge rotor is provided which can be molded from a single cavity mold with no secondary operations. The rotor includes a central hub portion and a generally frusto-conical outer portion extending downwardly and radially outwardly from the central portion for holding the tubes to be centrifuged. The frusto-conical portion is provided with a plurality of radially outwardly extending recesses, each recess being defined by radially-spaced bottom wall portions and radially-spaced top wall portions, the top wall portions being aligned with the spaces in the bottom wall portions. A tube positioned within a recess is held securely by a pair of bottom wall portions and a pair of top wall portions, but at any cylindrical cross section through the frusto-conical wall the tube is held by only a top wall or a bottom wall.

3,825,179

ELECTRIC MARK PERFORATOR

Katsumi Otsuka, Funabashi, Japan, assignor to New Kon Industrial Co., Ltd., Tokyo, Japan

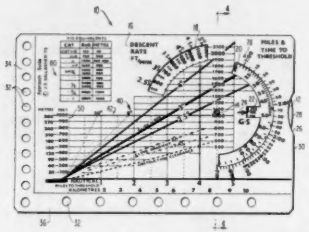
Filed Oct. 13, 1972, Ser. No. 297,247
Claims priority, application Japan, May 23, 1972, 47-60052
Int. Cl. G06k 1/10
U.S. Cl. 234—51 **10 Claims**



An electric mark perforator in which when a lead tape having a selected thickness has been positioned in the perforation station defined between a perforated wheel and a cooperating perforating mechanism having a plurality of movable needles, one push button selected from a plurality of push buttons bearing different characters, numerals and/or other symbols which project out of the main body of the perforator is pushed down to rotate the perforated wheel having in its periphery perforated marks corresponding to those of the push buttons until the perforated mark corresponding to that of the pushed-down button comes to face the perforation station in which the lead tape is positioned whereupon rotation of the wheel is stopped and thereafter, the perforation mechanism advances to the perforated wheel so as to insert its plurality of perforation needles through the perforations defining the marks in the perforated wheel, but the needles which define the contour of the particular mark strike against the unperforated areas in the periphery of the wheel, thereby stopping their advance,

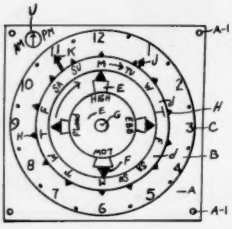
whereas the remaining needles which do not define the contour of that particular mark pass through the perforations thereby defining the particular mark in the lead tape, and thereafter, the push button is returned to its original position. The above procedure is repeated to define a desired number of marks in the lead tape which in combination represent an information by perforations.

3,825,180
AIRCRAFT APPROACH GUIDE
John D. Gallagher, R.R. No. 1, Inglewood, Ontario, Canada
Filed June 21, 1973, Ser. No. 372,019
Int. Cl. G06c *27/00*
U.S. Cl. 235—78 HO **4 Claims**



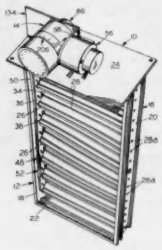
A landing approach computer is disclosed which allows computation of landing approach data in relation to ground speed. The computer is cooperable with a grid which provides a profile display of a glide path which is related to the data obtainable from the computer. Both the computer and the grid are cooperable over an infinite range of parameters.

3,825,181
TIDE AND TIME CALCULATING DEVICE
Philip M. Banner, 28 Oxford Rd., Massapequa, N.Y. 11758
Filed Apr. 11, 1972, Ser. No. 243,001
Int. Cl. G06c *3/00*; **G04b** *19/26*
U.S. Cl. 235—88 **5 Claims**



A time and tide calculating device that registers the tides and time of the tides, comprising a base having a standard time dial face imprinted upon same and a rotatable concentric tide calandar dial member, associated with said time dial and base peripherally adjacent and for indicative registration with the calibrations of said time dial. Another smaller tide selector dial concentric and rotatable independently to the other dial members and base, having exact tide definitions and markings with arrows settable to the calandar dial below it, so that the tide and time values can be pre-set upon a calculator or time piece so as to render this important information, necessary to all navigation.

3,825,182
CONTROL DEVICES FOR DAMPERS AND THE LIKE
Donald K. Bauchmann, 1801 St. George Pl., Kinston, N.C. 28501
Filed May 17, 1973, Ser. No. 361,280
Int. Cl. H02k *11/00*; **F16k** *31/04*
U.S. Cl. 236—1 C **16 Claims**

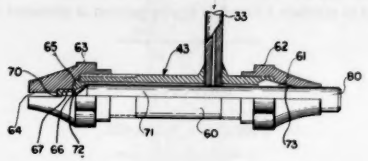


A control device is provided for dampers and the like which are adapted to be installed in a duct system whereby the combined control device and damper function as an air valve to control the flow of heated or cooled air to zones of individual rooms or offices of a building. The control device is mounted on a damper unit so as to be operatively engaged with a push rod which is utilized for simultaneously moving all of the blades of the damper unit from the closed to the open position thereof, with the blades being moved from their open to their closed positions preferably by means of a return spring. The control device includes a housing having a shaft extending outwardly from one end thereof and having any one of a plurality of interchangeable control caps detachably mounted at the other end of the housing in such a manner as to be operatively connected to the shaft. Each of the control caps is capable of housing therewithin the components of one of a plurality of different forms of electrical circuits, each of which is adapted to be actuated in response to a signal received from a thermostat. The outwardly extending shaft is operatively connected to one end of a worm gear which comprises one of the components of a gear train that is driven by an electrical motor, the latter being connected in circuit relation with the circuitry of the control cap and the thermostat. The other end of the gear train has mounted thereon a cam which is supported so as to be engageable with a cam follower that is connected to the push rod thereby providing the means whereby the control device is operatively engaged with the push rod of the damper unit to control the flow of air through a duct system, by controlling the extent to which the blades of the damper unit are opened or closed.

3,825,183
ORCHARD HEATING SYSTEM & BURNER
Sigmund H. Machlanski, 7017 Park Lawn Dr., Gregory, Mich. 48137
Division of Ser. No. 125,053, March 17, 1971, Pat. No. 3,750,642. This application Dec. 13, 1972, Ser. No. 314,631
Int. Cl. G05d *23/275*
U.S. Cl. 236—93 **6 Claims**

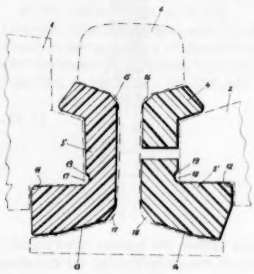
A system for supplying liquefied petroleum or gaseous fuel to an array of grove heaters including a central gas supply valving distribution system and thermostatic control. The system includes a number of high efficiency heaters, each with a shielded pilot flame burner and assembly and automatic cutoff valve in the event of pilot flame extinguishment. The burner includes a helical flame path in intimate contact with a tubular body member constituting horizontal radiating surface and a top diffuser cover for optimum heat distribution in a horizontal direction. The burner assembly includes a shielded

pilot flame with a continuous metal flame attachment member for insuring the expansion of burner flame from pilot to full



flame in full operation without flameout. The burner includes a temperature responsive valve which is effective and readily adjustable in the field.

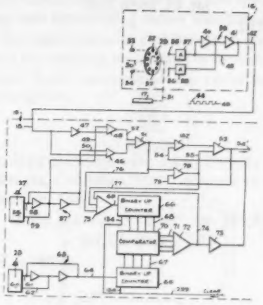
3,825,184
LEVEL CROSSING STRUCTURES
Gerhard Hartl, Vienna, Austria, assignor to Semperit Aktiengesellschaft, Vienna, Austria
Filed July 10, 1972, Ser. No. 270,025
Claims priority, application Austria, July 9, 1971, 5980/71
Int. Cl. E01b *21/00*
U.S. Cl. 238—8 **2 Claims**



The invention relates to level crossing structures of the kind in which slabs, which form part of the roadway and on whose upper edge level with the rails there is a stepped recess for a wheel rim, are held in place by a lower part, projecting from the recess and engaging moulded bodies forming a bearing and adapted to conform with the lateral profile of the rails.

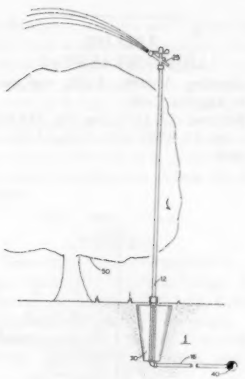
3,825,185
PAINTING OF INTERRUPTED LINES ON ROAD SURFACES
Francis A. Moon, Palos Verdes, and Robert G. Halliday, Malibu, both of Calif., assignors to Unimasco, Inc., Gardena, Calif.
Filed Feb. 8, 1973, Ser. No. 330,595
Int. Cl. B05b *1/28*
U.S. Cl. 239—150 **22 Claims**

Apparatus for painting an interrupted line on a road surface, including a digitizer for producing a series of pulses in accordance with movement of a motor vehicle along the road surface, and control means operable by the digitizer to actuate a paint spraying gun carried by the vehicle between spraying and nonspraying conditions in accordance with the number of pulses produced by the digitizer. Preferably, pulses can be added to or subtracted from the pulses produced by the



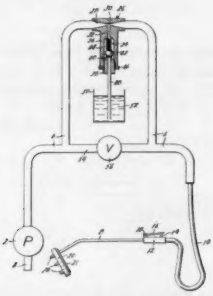
digitizer at will in a manner advancing or retarding the time at which the paint sprayer is actuated between its two conditions.

3,825,186
IRRIGATION RISER BASE SYSTEM
Richard H. Heenan, and George M. Litsinger, both of Atlanta, Ga., assignors to The Coca-Cola Company, Atlanta, Ga.
Filed Apr. 20, 1973, Ser. No. 353,055
Int. Cl. B05b *3/10*
U.S. Cl. 239—280 **8 Claims**



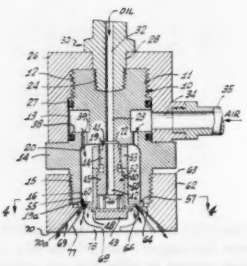
An irrigation riser base system is described which substantially improves the support capabilities of a permanent overhead irrigation system in different soil conditions, including sandy soils. The irrigation riser base system is composed of an improved riser base that is sunk into the soil for a length sufficient to facilitate its connection to a central irrigation system connected to the base and arising approximately 20–25 feet above the ground is a riser pipe that has a sprinkler head fastened to the top end thereof. During normal operations, an irrigating liquid is supplied through the system and distributed to the citrus trees or other vegetation. The irrigation riser base system is lightweight, yet strong and rigid for dependable performance in different soil conditions, has excellent support capabilities in sandy soils, inexpensive to manufacture and requires very little maintenance over extended use.

3,825,187
SYSTEM FOR SUPPLYING WASHING MACHINE NOZZLES
Harlan H. Tatge, 118 N. Broadway, Herington, Kans. 67449
Filed June 29, 1973, Ser. No. 375,084
Int. Cl. B05b 7/30
U.S. Cl. 239—312 **2 Claims**



A system for supplying washing machine nozzles consisting of a pump operable to deliver water through a conduit to a nozzle head with selectively usable nozzles having different flow restrictions, an aspirator pump disposed in the water conduit and operable by flow in the conduit to draw a liquid detergent from a reservoir through a detergent conduit and to intermix it with the water, a valve in the detergent conduit adjustable to open at or above an adjustably predetermined flow rate in the water conduit, and a by-pass conduit by-passing the aspirator pump in the water conduit and including a manually operable valve.

3,825,188
LIQUID SPRAY HEAD
Beauford C. Doering, Arcadia, Calif., assignor to Par-Wey Mfg. Co., Los Angeles, Calif.
Filed Mar. 23, 1973, Ser. No. 344,075
Int. Cl. B05b 1/02, 7/06, 15/04
U.S. Cl. 239—498 **8 Claims**

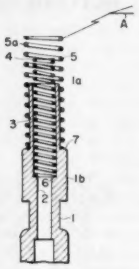


A nozzle for spraying liquids is provided. In a useful example, cooking oil is sprayed into baking pans using a conduit which discharges the oil at a center point between two concentric closely-spaced circular discs, in parallel horizontal planes, the lower disc being smaller than the upper disc, there being a large number of small air passages in a circular pattern extending downwardly through the upper disc, all around the border of the lower disc. The oil flows radially out from between the discs, and is impinged upon by air under pressure issuing downward from the air passages. Thereby the oil film is largely atomized and sprayed downwardly. Oil from between the discs not so atomized reaches the internal surface of a conical skirt, and is guided thereby down the skirt and off the lower edge thereof in an atomized condition. A solid cone of atomized oil particles is thereby delivered downwardly in a burst of only a few hundredths of a second. The skirt may be shaped to produce a round or square pattern of atomized oil.

ERRATUM

For Class 239—568 see:
Patent No. 3,825,402

3,825,189
BURNER VALVE NOZZLE ARRANGEMENT FOR LIQUID GAS LIGHTER
Yoichi Ohsawa, Tokyo, Japan, assignor to Ohsawa Manufacturing Co., Ltd., Tokyo, Japan
Filed May 25, 1972, Ser. No. 256,772
Claims priority, application Japan, Oct. 22, 1971, 46-97304; Nov. 22, 1971, 46-108559; Nov. 22, 1971, 46-108560
Int. Cl. F23d 13/00
U.S. Cl. 239—590 **9 Claims**

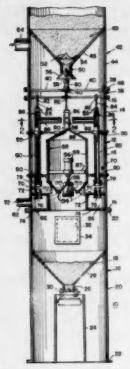


In a liquid gas lighter, the burner valve nozzle is arranged so that a plurality of mutually spaced air-communicating cylindrical members are provided on the nozzle to extend longitudinally beyond the edge thereof close to an electric discharge electrode which points to said nozzle and said members. This nozzle arrangement can be manufactured at low cost and serves to improve the mixing of the fuel gas with the ambient air and provides an improved igniting condition of the gas fuel.

3,825,190
APPARATUS FOR TREATING GRANULAR MATERIAL
John H. Kauffman, Richland Center, Wis., assignor to National Engineering Company, Chicago, Ill.
Filed Feb. 14, 1973, Ser. No. 332,415
Int. Cl. B02c 19/06
U.S. Cl. 241—40 **14 Claims**

Apparatus for cleaning granular material such as foundry sand and the like comprises a housing having upstanding tubular inner and outer walls in spaced apart coaxial relation defining an annular receiving chamber adjacent the lower end for holding granular material to be cleaned, annular plenum chamber means below said receiving chamber having an upper wall forming a base of said chamber and supporting a plurality of spaced apart injection nozzles for directing high velocity air flow upwardly into the granular material to lift the same via lift tubes having their lower ends coaxially aligned with and spaced above said nozzles for carrying an upward flow of airborne granular material for impacting against target means spaced above said inner wall, outlet means defined in

said outer wall for removing from said housing airborne fine particles of material obtained after impact of said material



against said target means and adjustable gate means below said target means for directing a flow of clean base particles of granular material through said inner wall for discharge.

3,825,191

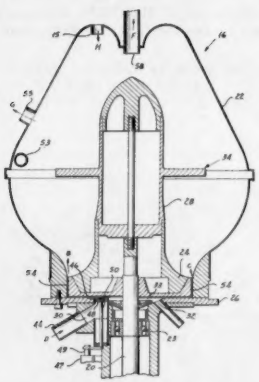
CENTRIFUGAL MILL FOR CONTACT TRANSFER ELECTROSTATIC COPIER

Ian E. Smith, Lockleys, South Australia, and Dennis I. Scroggs, Para Hills, South Australia, both of Australia, assignors to Savin Business Machines Corporation, Valhalla, N.Y.

Filed Oct. 5, 1972, Ser. No. 295,115

Int. Cl. B02c *13/14*

U.S. Cl. 241—46.11 **13 Claims**



A centrifugal impingement mill and developer supply system for an electrostatic copier using a developer made up of particles of tacky toner suspended in a carrier liquid in which a cylindrical spindle having a conical apex is provided with an annular radially extending vane located in the bulbous generally pear-shaped cavity of a housing and is provided with a relatively broad cylindrical base disposed in relatively closely spaced relationship to the wall of a shallow cylindrical recess in the housing below the cavity to form a vortex of developer liquid in the cavity above the recess and in which a first circulating path for developer containing relatively fine toner particles is provided from a point above the major diameter of the cavity to a developer applicator and back to an orifice adjacent to the top center of the housing and in which a second circulating path is provided for developer containing relatively coarse toner particles from a point adjacent to the major diameter of the cavity to the space between the spindle base and the housing recess wherein shear forces are applied to the toner particles and thence to the cavity. Means are provided for allowing air trapped in the form of bubbles in the developer liquid contained in the cavity to escape to the ambient atmosphere.

3,825,192

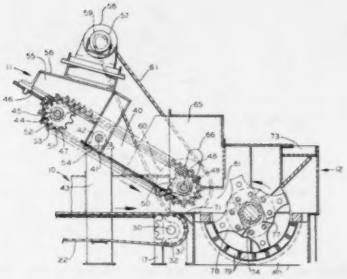
FEEDING MECHANISM FOR REDUCTION APPARATUS

Lloyd K. Knight, Columbus, Ohio, assignor to Jeffrey Galion, Inc., Columbus, Ohio

Filed Jan. 22, 1973, Ser. No. 325,885

Int. Cl. B02c *23/02*

U.S. Cl. 241—186 R **7 Claims**



Feeding mechanism to control and regulate the feed of a mass of materials into a reduction apparatus. There is a feeding table on which the materials are moved forwardly to the reduction apparatus. A hold-down is positioned above the feeding table, with its forwardmost end ahead of the feeding table and close to the reduction apparatus. The hold-down engages the materials and also moves the materials forwardly, while holding the mass of materials as the reduction means tears into the mass of materials to reduce the materials to a small product size.

3,825,193

GRANULATING APPARATUS

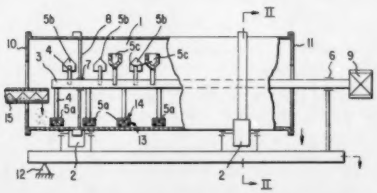
Wilhelm Lodige, Elsenerstr. 9c; Fritz Lodige, Leuschnerstr. 12; Josef Lucke, Im Lonfeld 15, and Karlheinz Luke, Detmolder Str. 27, all of Paderborn, Germany

Filed Apr. 14, 1972, Ser. No. 244,152

Claims priority, application Germany, Apr. 15, 1971, 2118231

Int. Cl. B02c *13/06, 13/28*

U.S. Cl. 241—187 **6 Claims**



Apparatus for granulating loose, fine-grained and/or powdered materials comprising a rotary drum and a separately

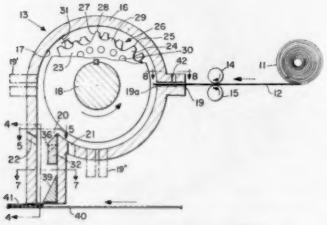
driven system of granulating tools. The tools are generally wedge-shaped and spaced at constant radial distances from the drum wall. The axial distance between adjacent tools decreases from the points to the rear ends thereof, thereby subjecting the material to a continual axial pulsating compression with subsequent expansion, thereby enhancing the granulating effect. The drum can be driven in opposite directions or at a faster or slower rate than the tools whereby optimum granulate formation can be achieved.

3,825,194

APPARATUS FOR PREPARING AIRFELT

Kenneth B. Buell, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sept. 22, 1971, Ser. No. 182,795
Int. Cl. B02c *13/06*
U.S. Cl. 241—191 **14 Claims**



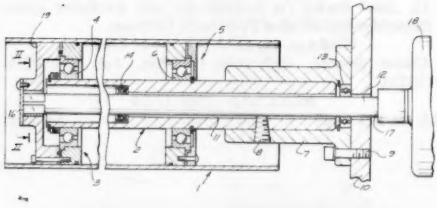
Apparatus for continuously converting dried cellulosic fibrous sheet material into a dispersion of individual fibers in air and thereafter forming said individual fibers into an airfelt.

3,825,195

DRIVE ROLL FOR WINDERS OF FILAMENTARY MATERIAL

Harry B. Miller, Hopedale, Mass., assignor to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Karlsruhe, Germany

Continuation-in-part of Ser. No. 262,973, June 15, 1972. This application Nov. 6, 1972, Ser. No. 304,253
Int. Cl. B65h *54/46*
U.S. Cl. 242—18 DD **5 Claims**



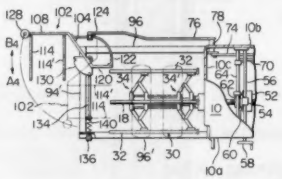
A hollow shaft is stationarily cantilevered on a support. A tubular friction roller is journalled on the shaft for rotation about the same. A drive shaft extends through the hollow shaft, being journalled therein, and has one endportion extending beyond one end of the hollow shaft but within the friction roll with which this endportion is drivingly connected. The other endportion of the drive shaft extends outwardly beyond the hollow shaft and friction roll for coupling with a drive.

3,825,196

HANK REELING MACHINE

Sakuzo Yamazaki, Kiryu City, Japan, assignor to Sankin Engineering Company Limited, Kiryu City, Japan

Filed Jan. 11, 1973, Ser. No. 322,871
Claims priority, application Japan, Jan. 15, 1972, 47-6462; Jan. 15, 1972, 47-7380
Int. Cl. B65h *54/56*
U.S. Cl. 242—53 **15 Claims**



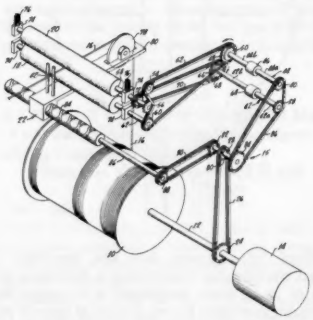
A improved hank reeling machine having a swift structure which is adapted to collapse around its axis as a spindle coaxially extending through the swift structure is axially moved in response to movement of a hank doffing unit which is incorporated in the reeling machine, wherein an arrangement is provided to vary the axial displacement of the spindle depending upon a selected perimetrical length of the swift structure so that the axial movement of the spindle is effected at an increased efficiency in accordance with the selected perimetrical length of the swift structure.

3,825,197

CABLE TENSION PRELOADER

Larry O. Sturgeon, 615 N. Hamlin St., Orange, Cali'. 92669, and Leonard L. Dueker, 2241 E. Evergreen, Mesa, Ariz. 85203

Filed Dec. 4, 1972, Ser. No. 312,028
Int. Cl. B65h *75/00*
U.S. Cl. 242—54 R **14 Claims**

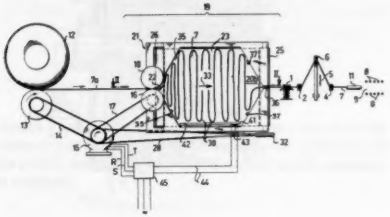


Apparatus and method for maintaining tension on a cable being wound on, unwound from, or held in readiness on a drum. Two contactors grip the cable and keep it in tension relative to the drum by means of a chain drive system powered by a motor driving the drum.

3,825,198
APPARATUS FOR THE STORAGE OF ELONGATE MATERIAL

Jurg Oehninger, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 24, 1972, Ser. No. 283,508
Claims priority, application Switzerland, Sept. 2, 1971, 012874/71
Int. Cl. B65h 75/02
U.S. Cl. 242—55 11 Claims

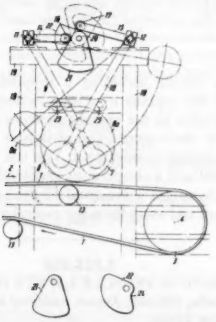


A container having entrance and exit apertures and two substantially flat parallel sides at least one of whose dimensions is large compared to their separation is provided with a driven endless belt, one of whose runs extends from the entrance to the exit aperture and forms at least part of one of those sides. Feed rolls at the entrance aperture and a spool unwinding roll exterior to the enclosure are driven from the same source as that which drives the endless belt, and a sensor in the container adjusts the speed of the driving means inversely with the quantity of material in the container.

3,825,199
DEVICE FOR THE MANUFACTURE OF PEAT BAND ROLLS

Pentti Samuel Nisula, Hamevaara, Finland, assignor to Lannen Sokeri Oy, Lansi-Sakyla, Finland

Filed May 30, 1973, Ser. No. 365,183
Int. Cl. B65h 75/00
U.S. Cl. 242—55 10 Claims

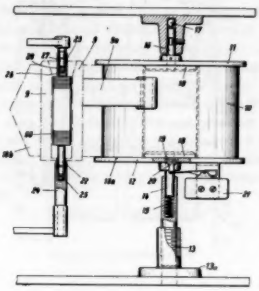


Apparatus for use in winding peat band rolls is provided wherein a pair of winding rolls is adapted to engage opposite sides of the forming peat band roll which is carried on a conveyor belt. The winding rolls are connected to rotatable lever arms which are in turn connected to eccenters, the eccenters being adapted to lift said winding rolls away from the completed peat band roll to permit its removal by the conveyor belt.

3,825,200
MECHANISM FOR MOUNTING ROLL PAPER

Werner Puhahn, Philippsburg, Germany, assignor to Standardwerk Eugen Reis GmbH, Bruchsal, Germany

Division of Ser. No. 61,758, Aug. 6, 1970. This application Feb. 11, 1972, Ser. No. 225,646
Claims priority, application Germany, Aug. 8, 1969, 693902
Int. Cl. B65h 25/06, 25/32
U.S. Cl. 242—57 1 Claim

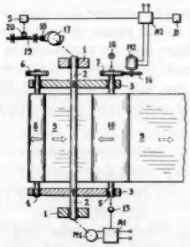


A money coin counting and wrapping machine having a support for a substantially endless reel of wrapping paper. The support is formed of a pair of spaced disks one of which is rotatable, the other of which is axially movable and non-rotatable and includes spring means to hold the reel pressed against the one disk. Means for sensing the quantity of paper in the reel are mounted on the non-rotatable disk. Also there is provided a support for stack of coins comprising an upper and lower axially aligned rotatable gripping pins cooperatingly arranged to grip the stack there between.

3,825,201
DEVICE FOR CONTROLLING THE LAUNCHING OF A REEL OF WEB IN AN UNWINDER WITH AUTOMATIC REEL CHANGE

Francesco Osta, Via Spanzotto 3, 15.033 Casale Monferrato (Alessandria), Italy

Filed May 22, 1973, Ser. No. 362,819
Int. Cl. B65h 19/18
U.S. Cl. 242—58.1 4 Claims



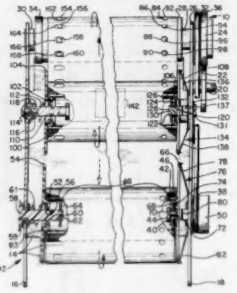
An automatic reel change unwinder wherein the reel holder arms are controlled by a change motor stopped by a detecting device, and a signal generator produces a signal depending on the stop position of the said arms for generating, in a computer, a signal suitable for controlling a launching motor which accelerates a new reel intended to replace an exhausted one.

3,825,202

CHART TRANSPORT

Clayton F. Robinson, Philadelphia, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 6, 1972, Ser. No. 295,708
Int. Cl. B65h *17/18, 75/18*
U.S. Cl. 242—67.2 **4 Claims**



A universal strip chart transport mechanism to support and laterally transport a strip chart between a supply roll and a reroll, said strip chart being adapted to be driven by a drive roll and having perforations adjacent opposite edges thereof for snugly receiving drive pins carried at the opposite ends of the drive roll. The supply roll and reroll are each provided with flanges at the opposite ends thereof, the pairs of flanges at adjacent ends of said rolls being biased toward the other ends of their associated rolls, the biasing forces acting on one pair of flanges being greater than the biasing forces acting on the other pair of flanges. Two modes of operation of the transport mechanism are contemplated, one in which the strip chart is referenced to one edge thereof and another in which the strip chart is referenced to the other edge, the perforations adjacent the remote edge of said strip chart, in each case, being laterally elongated. In said one mode of operation of said transport mechanism, a reference position for said chart is established by said one pair of flanges by the use of retaining means to determine the extreme position to which said one pair of flanges is movable by the associated biasing means. In the alternative mode of operation of said transport mechanism, a reference position for said chart is established by said other pair of flanges by employing the said retaining means to said last mentioned pair of flanges in a fixed position. This arrangement tends to minimize the tendency for the drive pins on the drive roll to become disengaged from the perforations in the chart as the result of lateral expansion and contraction of the chart due to variations in moisture content thereof. In each mode of operation the laterally elongated perforations are at the side of the chart that undergoes the greatest movement as the result of changes in moisture content.

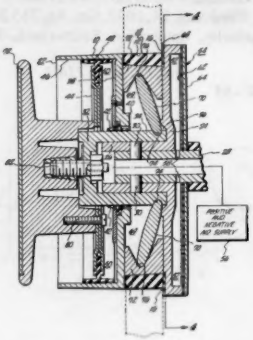
3,825,203

PNEUMATICALLY CONTROLLED BISTABLE REEL HUB MECHANISM

Kagne Jarle Kjos, Thousand Oaks, and Johan Henri Molleman, Newsbury Park, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Sept. 20, 1972, Ser. No. 290,768
Int. Cl. B65h *19/02*
U.S. Cl. 242—68.3 **10 Claims**

A bistable, pneumatically controlled hub, with a manual override, for locking a properly positioned reel on the hub by means of the expansion of a resilient ring channeled in the hub. The hub has an inner air chamber, including a reciprocable wall actuated by positive and negative air pressure supplied through the hub drive shaft and an auxiliary air chamber. Apertures in the auxiliary chamber are sealed only by the proper positioning of the reel on the hub permitting the



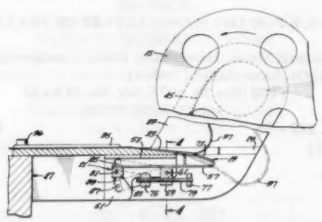
reciprocable wall to pivot an over-center device for alternately exerting and releasing pressure on portions of the inner circumference of the resilient ring, and thereby on the inner bore of the reel.

3,825,204

SENSING DEVICE FOR CONTROLLING THE MOVEMENT OF SHEET STOCK

Paul Vinson, 7821 N. 65th St., Scottsdale, Ariz. 85253

Filed Sept. 20, 1972, Ser. No. 290,460
Int. Cl. B65h *23/20*
U.S. Cl. 242—75.3 **18 Claims**



A sensing device including a support, an arm pivotally mounted on the support by a low friction connection, and a switch responsive to the angular position of the arm for controlling stock movement. The switch is of the type which requires no energy to operate it. The low friction connection includes a ball and a cooperating recess along the pivotal axis of the arm. A weight is mounted on the arm so that it can be moved toward and away from the pivotal axis.

3,825,205

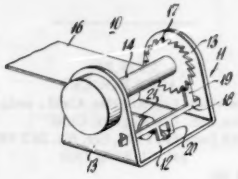
MOTOR VEHICLE SAFETY DEVICES

Takezo Takada, Hikone, Japan, assignor to Takata Kojyo Co. Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 157,562, June 28, 1971. This application June 8, 1972, Ser. No. 260,872
Claims priority, application Japan, Oct. 14, 1970, 45-090684; Oct. 6, 1970, 45-087139; July 14, 1970, 45-069730; Aug. 27, 1970, 45-084724
Int. Cl. A62b *35/00*; **B65h** *63/00*
U.S. Cl. 242—107.4 **8 Claims**

A vehicle safety belt system includes a spring rewind belt retractor reel provided with a solenoid actuated brake and a

network controlled by an inertia switch to brake the reel by the energization or deenergization of the solenoid and to maintain the reel in a braked condition an adjustable time interval following the deactuation of the inertia switch. The net-

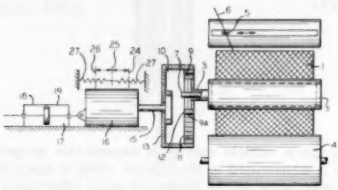


work includes a solid state Darlington switch having across its input a memory capacitor which is charged by the actuation of the inertia switch and a relay across its output which controls the brake solenoid.

3,825,206
WINDING DEVICE WITH DRIVE-ROLLER DRIVE

Heinz Schippers; Erich Lenk, and Hansjochen Busch, all of Remscheid, Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed Mar. 1, 1972, Ser. No. 230,851
Claims priority, application Germany, Mar. 4, 1971, 2110367
Int. Cl. B65h *54/42*
U.S. Cl. 242—18 DD **9 Claims**

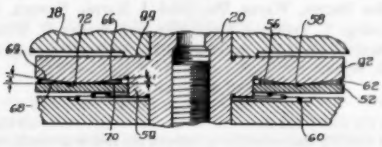


Winding device with drive-roller drive for winding endless threads on a bobbin tube securely held by means of a chuck, with a pressure-operated rod axially movable in the chuck for releasing the chuck and an electric or a pneumatic or hydraulic drive motor for starting rotation of the empty bobbin or providing an additional drive moment in the chuck shaft.

3,825,207
VISCOUS SENSOR

Mervin W. LaRue, Jr., Barrington, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed July 3, 1972, Ser. No. 268,838
Int. Cl. B65h *25/32*
U.S. Cl. 242—191 **11 Claims**

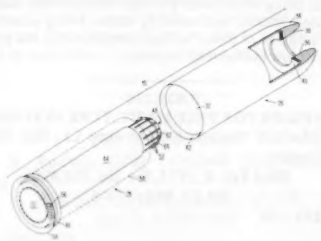


A viscous end-of-run and jam sensor and indicator for a cassette-type motion picture camera. A drag disk is mounted for rotation about the axis of rotation of the film take-up assembly and has a drag surface in closely-spaced juxtaposition with a rotatably-driven annular surface of the film take-up assembly. A quantity of viscous fluid is disposed between the drag surface and the rotatably-driven surface to form a viscous coupling therebetween to impart torque to the drag disk during rotation of the film take-up assembly. The drag surface and the rotatably-driven surface have continuous peripheral portions which define a small acute angle of divergence sufficient to effect retention of the viscous fluid between the drag surface and the driven surface by capillary attraction. A bias spring maintains the drag disk in a predetermined quiescent position in the absence of rotation of the film take-up assembly. An electrical circuit includes in series connection a voltage source, a manually-actuatable camera-actuation switch, a sensing switch, and an indicator lamp. The sensing switch is maintained closed by an arm extending from the drag disk when the drag disk is in its quiescent position. The indicator lamp thus will be energized in response to a cessation of rotation of the film take-up assembly due to the end of the run of the film or a film jam occurring while the camera-actuation switch is closed.

3,825,208
CARTRIDGE AND STORAGE APPARATUS

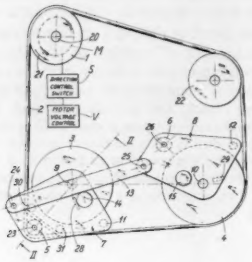
Daniel H. Johnston; Rudy Mannheimer, both of Boulder; Helfried O. Rinkleib, Longmont; Ivan D. Walker, Boulder, all of Colo., and John R. Kellner, Big Pine Key, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1972, Ser. No. 318,954
Int. Cl. G03b *1/04*; **G11b** *15/32, 23/04*
U.S. Cl. 242—197 **32 Claims**



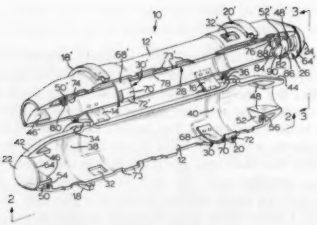
This cartridge storage apparatus includes detents for engaging and supporting a cartridge. The cartridge is comprised of a hub member for receiving a wound web and a shell cover to generally enclose the winding surface of the hub. One end of the hub is hollow and open. The hollow open end of the hub is accessible both when the winding surface of the hub is enclosed within the shell and when the hub is separated from the shell. The cartridge and the hub of the cartridge are both unique in that the inner surface portion of the hub, accessible through the hollow open end, includes a portion that actively grips the detent, that portion including a surface irregularity. The hub member and shell each carry a portion of a locking mechanism which enables them to be releasably locked together in a closed position. The locking arrangement is distinguished by the requirement that a separate tool is normally needed to disengage it when separation of the hub and shell is desired. The invention also includes the combination of a unique cartridge with a record handling system when the cartridge includes a wound record media.

3,825,209
TAPE RECORDER DRIVING MECHANISM
Eric Mikkelsen, Struer, Denmark, assignor to Bang and Olufsen A/S, Struer, Denmark
Filed Nov. 27, 1972, Ser. No. 309,917
Claims priority, application Denmark, Nov. 26, 1971, 5795/71
Int. Cl. B11b 15/32; G03b 1/04
U.S. Cl. 242—201 12 Claims



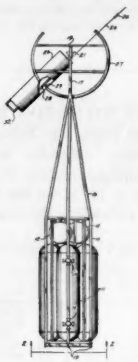
A tape recorder drive mechanism comprising a motor driven capstan and motor driven spool carriers operable to selectively cause the tape to be wound up and unwound, respectively, with low speed by normal operation and with high speed by fast forward or rearward winding, characterised by the combination that the capstan is driven by a separate motor and that for driving the spool carriers there is used a single winding motor operable to selectively drive either of said spool carriers with a high or a low moment of rotation depending of the operation condition, whereas said winding motor is electrically reversable and is connected with automatic coupling means operable to establish driving connection between the motor and one or the other spool carrier in accordance with the direction of rotation of the motor, said driving means being established through substantially nonslipping transmission means, said winding motor being adapted to be fed with a higher or lower voltage, respectively, for producing said high or low moment of rotation.

3,825,210
CARRIER FOR PNEUMATIC TUBE SYSTEMS
Peter Brinkerhoff Weaver, 5 Brushwood Ct., Don Mills, Ontario, Canada
Filed Feb. 8, 1973, Ser. No. 330,490
Int. Cl. B65g 51/06
U.S. Cl. 243—34 9 Claims



The invention relates to a carrier for transporting articles through pneumatic tube systems. The carrier has first and second shells disposed about a longitudinal axis and connected by hinges such that the shells are moved transversely relative to one another when opening and closing the carrier. A pair of ring seals are provided intermediate the ends of the carrier for guiding the carrier through a pneumatic tube system and for limiting air seepage past the carrier. End portions of the carrier are tapered to terminate in bumpers and a pair of latches are coupled to the shells for retaining the carrier in a closed position. A lock is provided for combining with the closed shells to prevent unauthorized opening of the carrier.

3,825,211
LASER ROCKET
Michael A. Minovitch, Los Angeles, Calif., assignor to Phaser Telepropulsion, Inc., Los Angeles, Calif.
Filed June 19, 1972, Ser. No. 263,987
Int. Cl. B64g 1/00
U.S. Cl. 244—1 SB 13 Claims

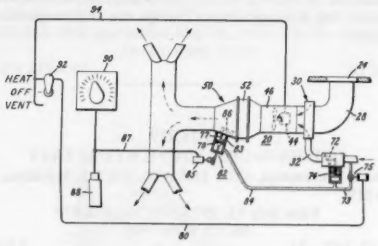


This space vehicle carries a vaporizable propellant and energy is transmitted to the vehicle while in space by a laser beam originating on the ground or some other body or satellite. The space vehicle has replaceable propellant tanks and propellant flow from them through a transparent tube on the focal axis of a parabolic cylindrical reflector. A high energy laser beam concentrated by the reflector heats the propellant which then travels through a swivel to a rocket nozzle aligned with the vehicle center of mass. The reflector and tube form an energy gathering assembly that is mounted for pivoting about an axis transverse to the vehicle axis for maintaining alignment with a remote laser station. Several incremental operations of the laser rocket can sequentially boost it to more energetic orbits and eventually to escape velocities. Such a vehicle can be conveniently used as a "tug" for other space vehicles.

3,825,212
AIRCRAFT HEATING AND VENTILATING SYSTEM
Walter Darges, Wayne, Pa.; John J. Karpis, Newark, Del.; George L. Petitgout, Gradyville, and Walter G. Witbeck, Media, both of Pa., assignors to The Boeing Company, Seattle, Wash.
Filed July 10, 1973, Ser. No. 377,982
Int. Cl. B64d 13/08
U.S. Cl. 244—118 P 9 Claims

A heating and ventilating system, for use in aircraft, which provides a constant flow of air to the aircraft cabin is described. Ambient air is mixed with bleed air from the compressor stage of a turbine engine. The mixture of ambient and bleed air is propelled into the aircraft cabin by a constant

R.P.M. blower. Prior to entering the cabin the mixed air may pass through a water and particle separator. A suitable control

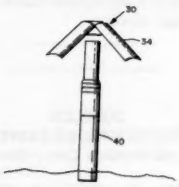


system is provided which maintains a pre-selected temperature by varying the amount of bleed air introduced into the system.

3,825,213
RELEASE MECHANISM FOR A SONOBUOY ROTOCHUTE ASSEMBLY

Roger I. Saunders, Hollis, and Edward J. Cloutier, Londonderry, both of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Mar. 1, 1973, Ser. No. 337,034
Int. Cl. B64d *19/02*
U.S. Cl. 244—138 A **15 Claims**



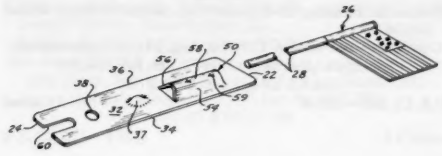
A mechanism to effectuate the release of a rotochute assembly from a sonobuoy unit upon impact with the surface of water. The release mechanism comprises an arming device, a moveable inertial catch and associated latch arrangement, and a compressed spring device. When the sonobuoy unit is ejected from an airplane, the arming device is activated and the inertial catch of the release mechanism is now free to move. Upon impact with the water surface, the inertial catch disengages itself from the latch arrangement, the latch arrangement pivots away from the unit in the presence of the released compressed spring device, and the rotochute assembly is free to separate from the sonobuoy unit.

3,825,214
FLAG HOLDER

Quentin P. Ciolfi, Rt. 1, Box 110, Miami, Fla. 32570

Filed Aug. 16, 1973, Ser. No. 388,990
Int. Cl. F16m *13/02*
U.S. Cl. 248—43 **4 Claims**

An improved flag holder which includes optional means for a quick release attachment in the form of a slot to interconnect to the rear axle of a bicycle or motorcycle or other type of axle for a vehicle and which also includes a through opening adjacent to the slot whereby the flag holder may be more permanently attached to the axle of a vehicle and which includes holder means with stop means to orient the holder in a predetermined position relative to the holder and to securely

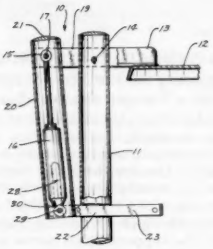


hold the same in a fixed anchored position which includes a web and portions deformed out of the plane of the web and defining the holder means and stop means.

3,825,215
COVER ASSEMBLY

Keith B. Borglum, 218 Loma, Waterloo, Iowa 50701

Filed June 22, 1972, Ser. No. 265,400
Int. Cl. B65d *45/00*
U.S. Cl. 248—147 **1 Claim**

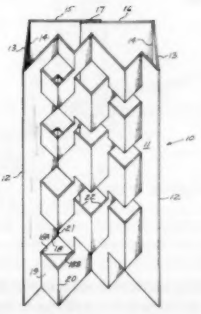


A cover assembly for refuse containers or the like including dampening means adapted to allow the cover to close slowly and automatically from any open position. The cover and dampening device (preferably a telescoping hydraulic cylinder) are connected by pivot means to a post which may be fixed in concrete or ground or may be attached to a base plate.

3,825,216
FOLDING DISPLAY

Samuel H. Rodvien, 5400 Yarmouth Ave., Encino, Calif. 91316

Filed Dec. 29, 1972, Ser. No. 319,363
Int. Cl. A47b *97/00*
U.S. Cl. 248—174 **1 Claim**



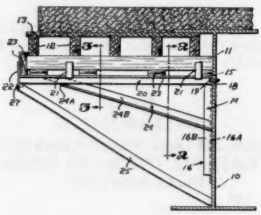
A screen of alternately oriented accordian folds opens out for display of small objects placed on support points or shelves thereon.

3,825,217

BRACKETS ATTACHABLE TO AN OUTSIDE BRIDGE GIRDER

Howard B. Fleming, 89 Pleasant Ave., South Portland, Maine 04106

Continuation of Ser. No. 175,500, Aug. 27, 1971, abandoned.
This application Dec. 13, 1972, Ser. No. 314,593
Int. Cl. E04g 3/00; A47g 29/02
U.S. Cl. 248—205 R 2 Claims



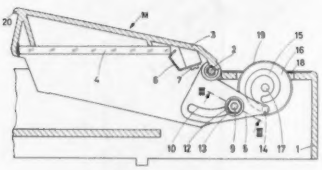
A bracket is disclosed that is attachable to an outside bridge girder for supporting the form for a concrete overhang. The bracket includes a T-shaped member whose inner face is flat and whose head is attachable to the web of the girder with said face in contact therewith. The outer face of the member has an outwardly disposed reinforcement extending from its lower end into the head. The inner ends of a support and of a brace are welded to the member in vertically spaced relationship and the outer end of the brace is welded to the support adjacent its outer end which has an end plate having a portion disposed below the support which serves as an anchor for an additional brace.

3,825,218

PROJECTOR WITH ADJUSTABLE IMAGE REFLECTING MIRROR

Fritz Krumbein, Stuttgart-Mohringen, and Hans Lieckfeldt, Stuttgart, both of Germany, assignors to Robert Bosch Photokino GmbH, Stuttgart, Germany

Filed Nov. 27, 1972, Ser. No. 309,650
Claims priority, application Germany, Nov. 25, 1971, 7144352
Int. Cl. G03b 21/28
U.S. Cl. 248—466 16 Claims



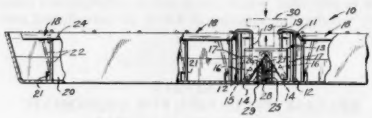
A projector wherein the housing supports a mirror which is pivotable from an inoperative position to any one of a number of image projecting positions. The mirror has a projection extending into an arcuate slot provided in a selector which is adjustable relative to the housing about the pivot axis of the mirror by way of a rotary cam. By rotating the cam, the user of the projector can move the mirror by way of the selector to and from any desired projecting position. The mirror can be yieldably biased against the selector so that it normally shares the movements of the selector but can be pivoted relative to the selector in order to be moved to and from its inoperative position. The selector cannot change the angular position of the cam.

3,825,219

ONE-HAND OPERATED ICE CUBE TRAY

Aaron E. Cummings, 4706 10th Ave., No. D3, Brooklyn, N.Y. 11219

Filed July 13, 1973, Ser. No. 378,973
Int. Cl. B29c 7/00
U.S. Cl. 249—71 5 Claims



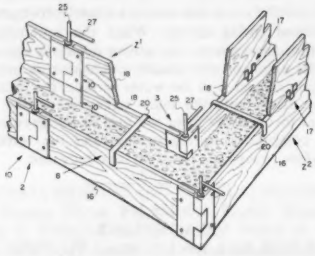
This cube tray consists primarily of a pair of parallel spaced apart divider walls running longitudinally of the tray, the divider walls having pivotable crosswise dividers, the combination being moved by means of levers secured to vertical members in which rollers are slideable, the rollers being pivotably secured to the ends of a depressible frame which is returnable by spring and plunger means.

3,825,220

CONCRETE FORM WORK JOINT MEMBERS

Edwin Schmaltz, 46 Nordale Cres., Toronto 15, Ontario, Canada

Filed Nov. 7, 1972, Ser. No. 304,506
Int. Cl. E04g 11/08
U.S. Cl. 249—194 1 Claim



A removable form for moulding concrete has mortice and tenon type joints permitting adjacent forms to be arranged in a selected one of a three-way relation, with locking bars to secure the joints having a cam lock to retain the locking bar in place. The joints provide a substantially impermeable pouring face, and the locking bar carries a protective loose piece to seal the cam lock against pouring splash.

3,825,221

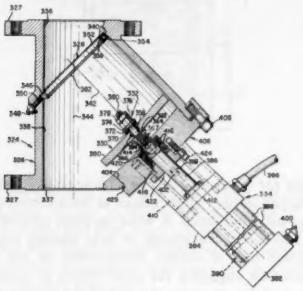
VALVES FOR ROASTING APPARATUS AND OTHER APPLICATIONS

Horace L. Smith, Jr., Richmond, Va., assignor to Smitherm Industries, Inc., Richmond, Va.

Division of Ser. No. 301,977, Oct. 30, 1972, Pat. No. 3,763,766. This application May 22, 1973, Ser. No. 362,824

Int. Cl. F16k 31/43

U.S. Cl. 251—62 8 Claims



Apparatus for roasting particulate solids which includes a system for heating and circulating a fluid through a roasting vessel and arrangements for supplying material to be processed to and discharging it from the reactor.

3,825,222

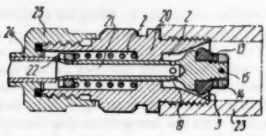
CHARGING PIPE UNION

Nina Vladimirovna Petrova, Leningradsky Prospekt 5, kv. 152, Moscow, U.S.S.R.

Filed June 8, 1972, Ser. No. 260,735

Int. Cl. F16l 29/00

U.S. Cl. 251—149.6 1 Claim



A charging pipe union comprising a body with an axial through passage having from the side of an apparatus being charged a tapered seat which is to be covered by a spring-loaded check valve shaped like a truncated cone, the valve being made integral with a pusher located within the passage of the body. An elastic sealing ring, attached to the check valve, is made with a truncated cone shape, having its larger base facing the check valve. The sealing ring is provided with a rounded portion touching the tapered seat under some preloading pressure to assure sealing of the check valve, while a smaller base of the ring is made rigid.

3,825,223

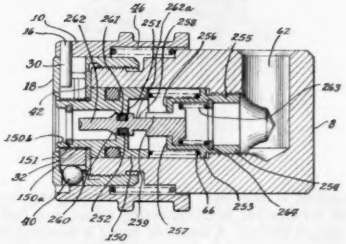
CONNECTING PLUG FOR TESTING TUBES AND WITH INTERNAL VALVE THEREIN

William D. Richardson, Palos Heights, Ill., assignor to Tuthill Pump Company, Palos Heights, Ill.

Continuation-in-part of Ser. Nos. 231,332, March 2, 1972, Pat. No. 3,727,952, and Ser. No. , , which is a continuation-in-part of Ser. No. 54,288, July 13, 1970, abandoned. This application Sept. 20, 1972, Ser. No. 291,389

Int. Cl. F16l 37/28

U.S. Cl. 251—149.6 8 Claims



An easily manipulable tube connector for connecting tubing to test equipment and the like wherein the connector has gripping means for gripping a tube therein and an internally movable plunger which is sealed to the tube being tested. The plunger moves axially within the connector when a tube is being sealed thereto and in the course of that movement opens a valve within the plunger for exposing the tube to a pressure passage.

3,825,224

NEEDLE PLUG COCK

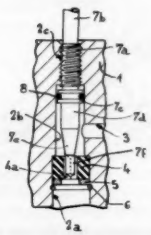
Roger Remane, Sainte-Colombe, France, assignor to Societe Anonyme: "Application Des Gaz,", Paris, France

Filed July 5, 1973, Ser. No. 376,517

Claims priority, application France, Oct. 25, 1972, 72.38344

Int. Cl. F16k 47/00

U.S. Cl. 251—205 3 Claims



Needle plug cock with seat made of elastically deformable material such as rubber or elastomers of the same kind, characterized in that the said seat (4) comprises an orifice (4*a*) having a non-circular cross-section such that under the action of the deformation to which it is subjected by the conical portion (7*e*) of the needle plug as the said plug engaged further into it, it adapts itself gradually to the circular cross-section of the said portion until it bears against the said portion over its entire periphery.

3,825,225

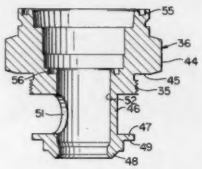
MANIFOLD ARRANGEMENT AND PARTS THEREFOR OR THE LIKE

Roy C. Demi, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 219,445, Jan. 20, 1972, Pat. No. 3,744,754, which is a continuation of Ser. No. 24,037, April 2, 1970, abandoned. This application May 16, 1973, Ser. No. 360,657

Int. Cl. F16k *43/00*

U.S. Cl. 251—363 **10 Claims**



A manifold arrangement for a fuel burning apparatus, the manifold arrangment interconnecting a source of fuel to the burner means thereof. A manifold fitting is disposed between the fuel source and the burner means and has passage means therethrough through which the entire fuel flow must pass to reach the burner means. The manifold fitting has a transverse opening therein leading from the exterior thereof to the passage means. A self-contained pressure regulator is received in the opening, the regulator having a housing that closes the opening and intersects the passage means of the manifold fitting in such a manner that the entire fuel flow through the fitting passes through the regulator housing and is thus under the control of the pressure regulator. When the regulator is removed or is not to be included in the arrangement, a plug is utilized to close the opening of the fitting.

3,825,226

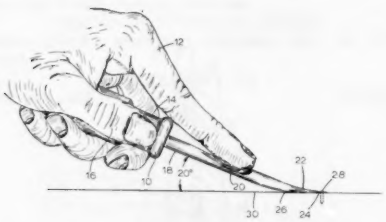
STAPLE REMOVER

James D. Appleman, 4 Filbert St., Hanover, Pa. 17331

Filed Jan. 18, 1973, Ser. No. 324,765

Int. Cl. B25c *11/00*

U.S. Cl. 254—28 **1 Claim**



A staple remover having handle and a shank terminating in a sharply tapered tip which at its extremity is substantially semi-circular in plan view to facilitate insertion beneath the cross member of an inserted staple, the lower surface of the tapered tip portion being gradually curved to form a progressive fulcrum engageable with an article from which a staple is being removed by rocking said curved surface thereon. The upper surface of the extremity of said tip portion also is offset downwardly to provide a stop shoulder for engagement by the cross member of a staple to limit insertion of said tip and also increase the sharpness of said extremity and thereby facilitate the insertion thereof beneath such cross member of a staple.

3,825,227

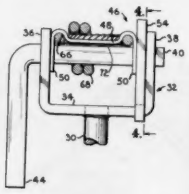
TENSIONING DEVICES

Rex G. Whitehill; Gerald D. Berchenbriter, both of Shenandoah, Iowa, and Winton D. Jensen, Leawood, Kans., assignors to Wickers Corporation, Saginaw, Mich.

Filed Aug. 16, 1972, Ser. No. 281,175

Int. Cl. A63b *61/04*

U.S. Cl. 254—161 **15 Claims**



A device for tensioning cables, straps or like flexible members employed in such applications as the anchoring of mobile homes against wind loads. A wind-up shaft receives the cable or strap and, after tensioning, is held against rotation by a locking plate that is shifted transversely of the shaft to a locking position engaging the shaft within an opening in the plate. For initially attaching the end of the flexible member to the shaft, a retainer thereon provides both eyes for a cable and a slot for receiving a strap in order to accommodate either.

3,825,228

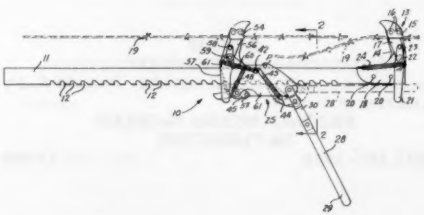
WIRE STRETCHER

William J. Greutman, Box 234, Miller, Nebr. 68858

Filed May 1, 1973, Ser. No. 356,154

Int. Cl. B66f *1/04*

U.S. Cl. 254—71 **3 Claims**



A wire stretcher including an elongate notched bar having a travelling wire gripper and a stationary wire gripper associated therewith. The travelling wire gripper utilizes a pair of dogs cooperating with the spaced notches on the bar to move the travelling wire grippers step by step along the bar. A lever connected with one of the dogs is straight and can be folded into parallel relation with the bar with its dog disengaged from the notches. In this position the second dog can then be also disengaged so that the travelling wire gripper can be moved to any desired position along the bar.

3,825,229

COMBINATION HANDRAIL AND WALL PROTECTOR

Gary F. Bartlett, Muncy, Pa., and Patrick L. Zampetti, Cranford, N.J., assignors to Construction Specialties Inc., Cranford, N.J.

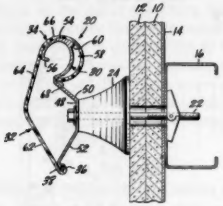
Filed Dec. 7, 1972, Ser. No. 312,849

Int. Cl. E04h *17/14*

U.S. Cl. 256—59 **25 Claims**

A handrail comprises an elongated, substantially rigid retainer and an elongated moderately resilient trim piece

received on the retainer, the retainer and trim piece together defining an elongated hollow unit. The trim piece is made of a durable, impact-resistant, resilient material and is mounted on the retainer in a manner affording limited and controlled deformation and displacement for absorption of energy upon impacting of the trim piece by some object. Nonetheless, an outwardly convexly curved handgrip portion on the trim piece



is supported and is in engagement with a correspondingly curved handgrip portion of the retainer so that the retainer imparts substantial rigidity to the handgrip portion of the trim piece. The retainer and trim piece are shaped in cross-section and provided with appropriate retaining structure such that the trim piece may be snapped into place on the retainer after the retainer has been installed.

3,825,230

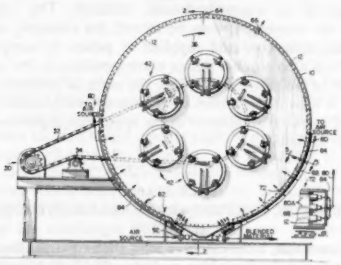
SAFE GEOMETRY NUCLEAR FUEL POWDER BLENDER

James A. Frye, Oklahoma City, and Ralph B. Morton, Del City, both of Okla., assignors to The Boardman Company, Oklahoma City, Okla.

Filed May 4, 1972, Ser. No. 250,130

Int. Cl. B01f *9/06*

U.S. Cl. 259—3 **10 Claims**



A safe geometry nuclear fuel powder blender of a tumble type having unique and improved concepts of loading and unloading, powder mixing pins, access hatches, and drive means. The powder is fluidized by an appropriate gas and subjected to a rocking motion to facilitate flow to a discharge mechanism of a vacuum pickup or screw conveyor type. Structural integrity and safe and easy operating access hatches are provided.

3,825,231

TWIN SCREW CONTINUOUS PROCESSING MACHINE

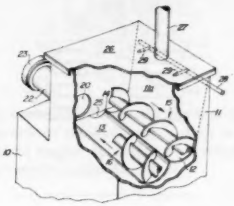
Archie Rae McFarland, Salt Lake City, Utah, assignor to Beehive Machinery Inc., Salt Lake City, Utah

Filed July 24, 1972, Ser. No. 274,574

Int. Cl. B01f *7/04, 7/08*

U.S. Cl. 259—41 **2 Claims**

A pair of conveyor screws located in side-by-side relationship on fixed, substantially horizontal axes at the bottom of a vessel such as a feed hopper are adapted to be rotated, preferably toward each other, to provide mixing action, and are preferably located peripherally of such bottom to provide a peripheral conveying path to a discharge outlet. One of the screws serves to transfer material to the other screw, whose discharge end is substantially coincident with the discharge outlet of the vessel. In material-processing equipment, wherein the vessel constitutes a feed hopper, a passage leads from the discharge outlet and communicates with material-processing mechanism, such as a grinder, meat or fish



deboner, etc. A pump may be interposed in such passage for advancing the discharge material from the hopper under pressure to the processing mechanism. A preferred aspect of the invention is to provide respective troughs at the bottom of the hopper for the conveyor screws, and to provide a material-transferring means at the discharge end of the transfer screw and a by-pass from the discharge end of the trough of the discharge screw to the trough of the transfer screw, so the material will idly circulate within the vessel if the discharge outlet is obstructed for any reason.

3,825,232

APPARATUS FOR TRANSPORTING AND MIXING CONCRETE

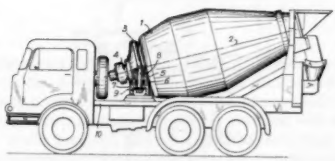
Piercelestino Pecorari, Via Pagliani, 41100 Modena, Italy

Filed Dec. 14, 1972, Ser. No. 315,172

Claims priority, application Italy, Dec. 16, 1971, 40155/71

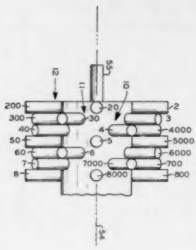
Int. Cl. B28c *5/20*

U.S. Cl. 259—177 R **8 Claims**



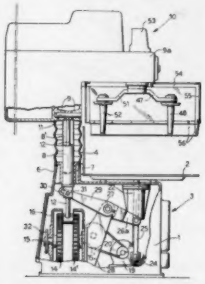
An apparatus for transporting and mixing concrete. The apparatus includes a vehicle having an elongated chassis which terminates in a rear end, and situated over this chassis is a rotary concrete mixer which has a rear discharge end at the region of the rear end of the chassis and a front end distant from its rear discharge end. A supporting structure supports the rotary concrete mixer at its front end for rotary movement about a given axis of rotation, and this supporting structure is interconnected with the chassis by way of a universal joint structure which gives the concrete mixer the capability of moving in all directions with respect to the chassis. A frictional resistance is provided at the universal joint structure to frictionally resist movement of the concrete mixer with respect to the chassis and the universal joint structure to a given extent, so that in response to forces transmitted to the concrete mixer from the chassis it will be possible for the concrete mixer displace itself with respect to the chassis when the forces are great enough to overcome the frictional resistance.

3,825,233
CARBON BLACK PELLETER
Eulas W. Henderson, Toledo, Ohio, assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Feb. 14, 1972, Ser. No. 225,981
Int. Cl. B01f 7/08, 7/02
U.S. Cl. 259—182 3 Claims



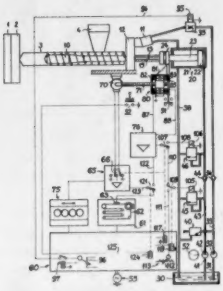
A carbon black pelleter in which the center lines of the pins on the shaft are spaced apart, when viewed in relation to the longitudinal axis of the shaft, a distance not greater than one pin diameter.

3,825,234
MACHINE FOR DRAWING SUGAR BASED PLASTIC MATERIAL
Giovanni Ruffinatti, Giaveno, Italy, assignor to S.A.S. Giovanni Ruffinatti & Co., Turin, Italy
Filed Apr. 9, 1973, Ser. No. 349,546
Claims priority, application Italy, Dec. 22, 1972, 71058/72
Int. Cl. B01f 7/04
U.S. Cl. 259—186 5 Claims



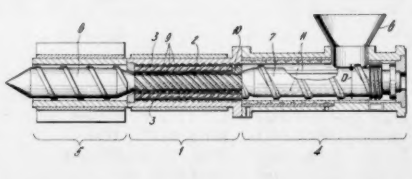
A machine for treating sugar based material in the plastic state by pulling or drawing and folding it to incorporate air into the material and to impart a fibrous silky appearance. The machine comprises a base carrying a table upwards from which extends a central post which is retractable below the table, and a head which projects over the table and carries two arms which are pivoted at one end and which have downwardly extending pins at the other end; the arms are positioned and shaped such that when they rotate about their pivoted ends the pins describe circles which overlap and which encircle the upstanding post without interfering with it or each other but such that when the material to be treated is placed in a central position on the table both the pins and the post can extend into it.

3,825,235
METHOD AND APPARATUS FOR PROCESSING PLASTICIZABLE MATERIAL
Walter Schwertfeger, Im Schein, 9244 Niederuzwill, and Bruno Stillhard, Wildeggstrasse 38, 9000 St. Gall, both of Switzerland
Division of Ser. No. 42,987, June 3, 1970, abandoned. This application June 29, 1972, Ser. No. 267,451
Int. Cl. A21c 1/06
U.S. Cl. 259—191 16 Claims



Apparatus for processing plasticizable material by extrusion from a die comprises a processing tool, such as a rotatable and reciprocable screw, which is supplied with power in accordance with a predetermined processing program. The desired and actual values of the movement of either the processing tool or the plasticized material processed by the tool are compared, as a function of time, along certain sections of the path of movement. The movement of the processing tool is regulated in accordance with differences between the compared desired and actual values. The apparatus is hydraulically operated under electrical, electromechanical or electrohydraulic controls. The desired values of the movement may be stored, for example, on an endless magnetic tape and supplied as pulses to comparing means which also receive pulses corresponding to the actual movement of the processing tool or the material plasticized by the tool. A forward and backward counter is included in the apparatus. In one embodiment of the apparatus, digital-analog converters are used.

3,825,236
MACHINE FOR THE PREPARATION AND EXTRUSION OF PLASTICS
Jurgen Hussmann, Gelsenkirchen, and Dieter Kurth, Bochum, both of Germany, assignors to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Germany
Filed Nov. 20, 1972, Ser. No. 307,803
Claims priority, application Germany, Nov. 24, 1971, 2158246
Int. Cl. B29b 1/10
U.S. Cl. 259—191 10 Claims



The machine includes a planetary roll extruder, a single-screw feeding device in advance of the extruder and a single-

screw extrusion press following the extrusion. The feeding device includes a cylinder and a feed hopper, and the feeding device, the extruder and the extrusion press are combined by having a common shaft extending therethrough. The common shaft, in the range of the feeding device and of the extrusion press, is designed as a screw shaft and, in the range of the planetary roll extruder, is designed as a central or "sun" shaft. The feeding device is constructed as a feed press, and at least one of the planetary spindles of the extruder is axially fore-shortened relative to the other planetary spindles to form a revolving receiving chamber for the material supplied by the feed press. The feed press is constructed to have a feed performance exceeding the receiving capacity of the planetary roll extruder and thus of the single-screw extrusion press. Preferably every other planetary spindle of the extruder is axially fore-shortened to form a receiving chamber.

3,825,237

FUEL FEEDING & CHARGE FORMING APPARATUS

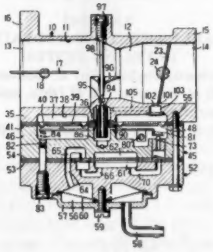
Taizo Aoyama, Tokyo, and Katsuya Kamosawa, Yokosuka, both of Japan, assignors to Nippon Carbureter Co. Ltd., Tokyo, Japan

Filed Nov. 22, 1971, Ser. No. 200,890

Claims priority, application Japan, Oct. 24, 1970, 45-105982

Int. Cl. F02m *17/04*

U.S. Cl. 261—35 **4 Claims**



A carburetor and fuel feeding arrangement for internal combustion engines which includes a substantially horizontally extending mixing passage with venturi and a fuel chamber located below said passage. A diaphragm constitutes an upper wall of the fuel chamber and is adapted to operate a fuel inlet valve. The diaphragm also forms a lower wall of a chamber which communicates with the atmosphere. A main fuel discharge orifice is positioned substantially on the center line of the diaphragm. A slow fuel passage branches from a fuel passage connecting the fuel chamber and the orifice and communicates with secondary orifices. Means is provided for discharging into the fuel passages the vapor generated when the apparatus is tilted to extreme positions or inverted. Means between the main fuel passage and the slow fuel passage is provided for preventing the flow of air from the main orifice to the secondary orifices during idling or slow speed motion of an engine.

3,825,238

OVERFLOW TYPE CARBURETTOR

Yoshio Nishihara, Atsugi, and Isamu Ohashi, Odahara, both of Japan, assignors to Mikuni Kogyo Kabushiki Kaisha, Tokyo, Japan

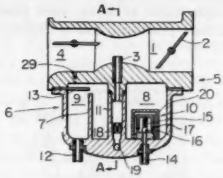
Filed Oct. 30, 1972, Ser. No. 302,378

Claims priority, application Japan, Oct. 10, 1971, 46-90086

Int. Cl. F02m *17/06*

U.S. Cl. 261—36 A **13 Claims**

An overflow type carburettor provided with fuel supply valve which closes the fuel inlet of the carburettor when the fuel supply pressure is not applied. Further the carburettor may be provided with a fuel channel which communicates with the lower end of the fuel feed duct leading to the fuel spray nozzle and the bottom of the fuel well of the fuel



chamber. This carburettor is free from leaking of fuel even when the stopcock of the fuel supply duct is left open, and provides stabilized engine operation even when the vehicle is driven in an extremely inclined position.

3,825,239

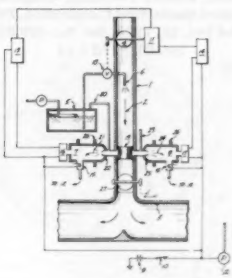
SPARK-IGNITION INTERNAL COMBUSTION ENGINE CARBURETORS

Eldred A. Rice, 905 163 Ave., Bellevue, Wash. 98008

Filed Aug. 21, 1972, Ser. No. 282,248

Int. Cl. F02m *7/16*

U.S. Cl. 261—50 R **7 Claims**



A carburetor for spark-ignition internal combustion engines in which the desired fuel-air mixture is maintained by electronically comparing the temperatures of combustion of two sampling burning jets. One sample is enriched with pure fuel vapor, while the other sample is diluted with pure air. The combustion temperatures of both jets are sensed by electronic means and a constant temperature difference between them is maintained by regulating the fuel-air mixture. The mixture regulation is accomplished by electro-mechanical means.

3,825,240

DEVICE FOR MAKING NODULAR CAST IRON

Hans Lustenberger, Schaffhausen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Oct. 2, 1972, Ser. No. 294,273

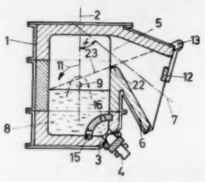
Claims priority, application Switzerland, Oct. 5, 1971, 14443/71

Int. Cl. C21c *7/00*

U.S. Cl. 266—34 T **4 Claims**

A device for making nodular cast iron with nodular graphite by introducing metallic magnesium into an iron-carbon melt, includes a drum-shaped treatment vessel with a longitudinal axis. The vessel has an opening for charging and discharging the melt and a chamber is formed within the vessel for supplying magnesium into the melt. Disposed around the opening in

the vessel is a collar which extends outwardly from the vessel and the axis of the collar is positioned at an acute angle to the longitudinal axis of the vessel. Further, as the axis of the collar extends outwardly it is inclined toward the opposite end of the vessel which contains the charge chamber. The treatment vessel is pivotally displaceable between three positions, a filling position, a treatment position, and a discharging position.



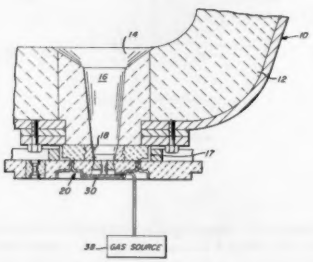
When the vessel is in the filling position its longitudinal axis is horizontal, while in the other two positions its longitudinal axis is approximately vertical. In the filling position, the vessel opening and the charge chamber are located above the longitudinal axis. In the treatment position the charge chamber is located below the opening and their positions are reversed in the discharging position.

3,825,241

APPARATUS FOR INTRODUCING GAS TO HOT METAL IN A BOTTOM POUR VESSEL

James T. Shapland, Wilkins Township, Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 26, 1973, Ser. No. 409,834
Int. Cl. F27d *3/14*
U.S. Cl. 266—38 **11 Claims**



A sliding gate apparatus for controlling the pouring of hot metal from a bottom pour vessel into a continuous casting mold is disclosed. The gate includes a permeable refractory block positioned beneath the vessel pouring opening when the gate is in the active position. The permeable plug has a low permeability center, thus any gas introduced to the hot metal through the plug will tend to flow near the sides of the vessel opening.

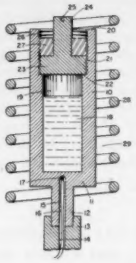
3,825,242

APPARATUS FOR DIRECT MELT SYHTHESIS OF INTERMETALLIC COMPOUNDS

Wilson P. Menashi, Lexington; Joseph F. Wenckus, Needham, and Roger A. Castonguay, Salem, all of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Division of Ser. No. 169,315, Aug. 5, 1971, Pat. No. 3,777,009. This application May 30, 1973, Ser. No. 365,135
Int. Cl. F27b *14/10*
U.S. Cl. 266—39 **16 Claims**

Method and apparatus for the melt synthesis of intermetallic compounds from metal components, at least one of which is highly volatile. The metal components are placed in a reaction vessel which is sealed by a liquid sealant in combination with a mechanical seal prior to heating the reactants to a temperature at which one or more of the reactants develops an appreciable vapor pressure. The atmosphere surrounding the



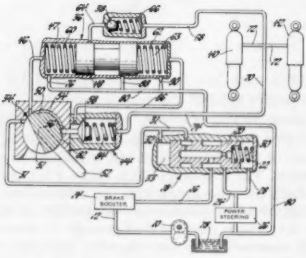
reaction vessel is pressurized to a pressure above the maximum vapor pressure developed by the reactants during the melt synthesis which is accomplished by heating the reactants. The combination of mechanical and liquid seal is of a character to permit diffusion by high-pressure gas through it.

3,825,243

MECHANICALLY ACTUATED HYDRAULIC VEHICLE LEVELING SYSTEM

Ralph D. Unterborn, Dayton; Roy C. Bodem, and Joseph W. Wanner, both of Kettering, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 30, 1972, Ser. No. 310,678
Int. Cl. F16f *5/00*
U.S. Cl. 267—65 D **3 Claims**



A vehicle hydraulic leveling system utilizing pressurized fluid supplied by an automatic transmission pump having a sump, the fluid being automatically supplied to leveling devices maintaining a normal constant height between sprung and unsprung masses. The fluid pressurized by the transmission pump is first supplied to a brake booster assembly and then is applied to a flow divider assembly which regulates flow between the leveling system and a power steering fluid circuit. If the vehicle height is normal or above normal, flow to the leveling system is blocked, the flow divider being biased directing 100 percent of the flow to the power steering system. If the height is below normal, the leveling system is automatically connected in fluid communication with the flow divider which directs approximately 10 percent of the flow to the leveling system. The pressurized fluid in the leveling system raises the leveling devices until the normal height is reached whereupon a control valve responsive to the height, moves blocking flow to the leveling devices. When the vehicle height

is above normal, the control valve is mechanically moved mechanically actuating an exhaust valve discharging pressurized fluid from the leveling devices to the pump sump until the normal height is re-established.

3,825,244

HYDRAULICALLY LOCKABLE LIFTING DEVICE

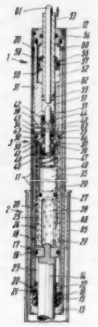
Fritz Bauer, Nurnberg, Germany, assignor to Suspa Federungstechnik GmbH, Altdorf b. Nurnberg, Germany

Filed Dec. 29, 1972, Ser. No. 319,751

Claims priority, application Germany, Dec. 28, 1971, 2164943

Int. Cl. F16f *9/18*

U.S. Cl. 267—124 **9 Claims**



A hydraulically lockable lifting device particularly adapted for height adjustment of tables comprising a gas spring in which a piston mounted in a piston rod and acting against compressed gas travels in a tube which is sealed with respect to the outside, wherein both sides of the piston are connected by an openable passage that connects chambers filled with an incompressible medium and a pump for pumping the incompressible medium from one chamber into the other.

3,825,245

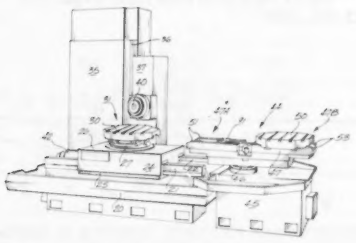
WORKPIECE CHANGER MECHANISM FOR A MACHINE TOOL

John G. Osburn, Milwaukee, and John J. Schachte, Wauwatosa, both of Wis., assignors to Kearney & Trecker Corporation, West Allis, Wis.

Filed Apr. 24, 1972, Ser. No. 246,827

Int. Cl. B23q *3/08, 1/06;* **B65q** *47/04*

U.S. Cl. 269—30 **9 Claims**



This invention relates to a work changing mechanism comprising a plurality of separate work receiving pellets, a working station for receiving one pallet for performing a working operation, and a plurality of storage stations including one empty storage station. A plurality of separate pallet securing means are associated with the storage stations, and are separately extensible relative to the working station. One of the securing means is operable to releasably retain a pallet in a storage station for selective interchange with a pallet supporting a workpiece for the performance of an operation in the working station. Another of the securing means in a storage station is empty and is selectively operative to bodily retract the pallet then in the operating station at the completion of the operation performed on the workpiece carried by that pallet. Retraction of the pallet from the operating station to the storage station by the empty securing means, is accomplished by the other securing means bodily interchanging the stored pallet in position in the now empty operating station.

ERRATUM

For Class 269—217 see:
Patent No. 3,825,117

3,825,246

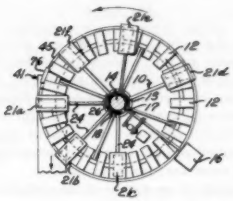
GATHERING MACHINE AND CONTROL THEREFOR

Frederick J. Elia; Donald C. Brothers, both of Easton; Clewell Hofschild, Saylorsburg, and Robert A. Bryson, Easton, all of Pa., assignors to Harris-Intertype Corporation, Cleveland, Ohio

Filed Apr. 5, 1971, Ser. No. 131,257

Int. Cl. B65h *39/02*

U.S. Cl. 270—58 **15 Claims**



Gathering machine in which a gathering station and feed stations are moved relatively to each other to feed items in sequence to the gathering station. If a feed station misses a feed, downstream stations for feeding the sequence are shut off until the group is again positioned to receive the missed item of the sequence. Feeding of the sequence is then reinitiated. When a station feeds double items at a rate greater than a predetermined rate, a control operation is performed.

3,825,247

ROTARY GATHERING MACHINE

Victoriano Fernandez-Rana, Easton, and Henry R. Mebus, Nazareth, both of Pa., assignors to Harris-Intertype Corporation, Cleveland, Ohio

Filed Mar. 8, 1973, Ser. No. 339,144

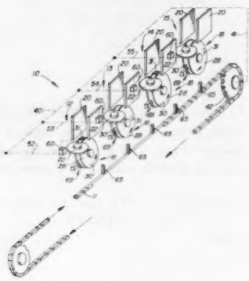
Int. Cl. B65h *39/02*

U.S. Cl. 270—58 **11 Claims**

A signature gathering machine includes a signature gatherer conveyor. A plurality of hoppers are spaced along the gatherer conveyor and are adapted to receive signatures therein. Associated with each hopper is a means for removing signatures from the hopper and conveying the signatures to the gatherer conveyor. The means which removes and carries the signatures includes a drum having a pair of grippers which rotate about an axis transverse to the direction of movement of the signature conveyor and which release the signatures in the direction of movement of the gatherer conveyor. The gatherer

conveyor has a plurality of pins projecting therefrom which engage signatures and move the signatures past the hoppers to a subsequent handling station. Adjacent pins are spaced apart a distance which is less than the distance between the hoppers and the grippers on adjacent hoppers are dephased with respect to each other. Each hopper includes a separator having a disc which separates the signatures from the hopper so as to be gripped by the grippers. The separator may be operated at either twice the speed of the grippers or at the same speed as the grippers.

In one mode of operation of the machine, the separator disc operates at a speed to separate two signatures per each revolution of the gripper drum and both grippers on the drum convey signatures to the gatherer conveyor. The spacing between pins on the signature conveyor is less than the spacing between hoppers and the gatherer conveyor speed is less than

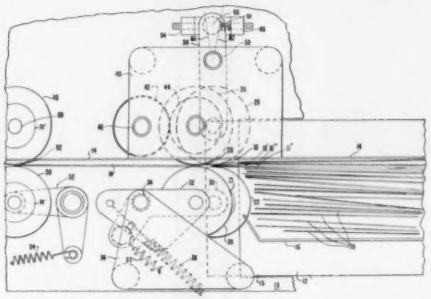


gripper speed. An individual signature is dropped from each hopper into each pocket defined by adjacent pins on the gatherer conveyor. This operation enables relatively short signatures to be handled at either a very high output rate of books per minute (one-third more than conventional), or for the standard output of books per minute enables the signatures to be handled and collected at a slower speed (one-third less than if the units were not dephased).

In another mode of operation of the gatherer, the separator disc is operated to separate one signature per each revolution of the gripper drum and the gripper drum and the gatherer conveyor are operated in the same speed relationship as in the first mode. In this mode of operation, each hopper deposits signatures in alternate pockets on the conveyor. The signatures deposited from adjacent hoppers may be the same signature so that every pocket on the signature gatherer conveyor receives the same signatures, or may be different signatures to provide different completed books.

3,825,248
SINGULATOR DEVICE FOR LETTER MAIL
Lindsay C. Friend, 3352 Walnut St., Camp Hill, Pa. 17011
Filed Sept. 7, 1972, Ser. No. 286,909
Int. Cl. B65h *3/52*
U.S. Cl. 271—10 **5 Claims**

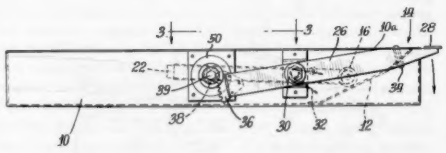
The singulator device has a flat conveyor belt for edge-feeding a continuous supply of letter mail pieces, having their address sides facing in the same direction and extending axially of said belt on their top edges in random endwise overlapping sequence on said belt between converging vertical guide walls, for funneling said mail pieces toward the nip of a first pair of rollers with high friction material on their peripheries, one of the rollers being driven forwardly through a slip clutch to pass the letter mail singly between the rollers and thereby frictionally drive the other roller against its reverse torque drive applied to it by a friction clutch, so that this roller will move back any overlapping letters that might enter the nip on its side of the passing letter which is next to said forwardly driven roller until said letter has cleared the nip, there being another set of at least one similar pair of rollers having their nips spaced slightly downstream from that of the first pair. One of the rollers in each pair of the second set may be an idler roller biased resiliently against the other so as to accommodate varying thicknesses of mail passing therebetween. The forwardly driven roller(s) in this set may be driven at a somewhat higher speed to pull the mail pieces which reach their nips through the first pair of rollers, which are thus driven at the higher speed as permitted by their respective slip clutches. The forwardly driven roller of the first pair is furthermore mounted on a lever extending substantially normally to the path of the mail pieces, so that this pull causes the lever to shift into a "stop" position, braking the slip clutch drive to the roller and



thus causing the roller to hold back any overlapping mail which may tend to enter the nip on the corresponding side of the piece being pulled therethrough. When this piece passes the nip, the lever is allowed to shift back to its normal "run" position by reason of a return spring biasing it thereto, and this roller then resumes its single feed to the nips of the pairs of the second set of rollers.

A third pair of rollers spaced further downstream not more than the length of the shortest piece of mail that might be fed to this device, and the drive roller of this pair is positively driven at a further increased speed to pull the piece through the lower speed rollers to secure a positive output of single letter mail with a fixed spacing between pieces so that they may be properly fed to a cancelling machine.

3,825,249
SHEET DISPENSER
Robert E. Zimmer, Niles, Ill., assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio
Filed Feb. 12, 1973, Ser. No. 331,916
Int. Cl. B65h *3/06;* **F16d** *13/00;* **F16h** *27/02*
U.S. Cl. 271—109 **1 Claim**



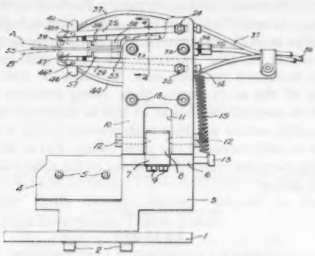
A container or drawer for storing a stack of sheets, and feeding sheets one-by-one from the stack, includes a feed mechanism comprising a manual lever swingable between the top and bottom boundry planes of the drawer and mechanically connected to feed elements resting on the paper stack through a speed augmenting gearing and a one-way clutch.

3,825,250

MATERIAL EDGE ALIGNING DEVICE

Roy E. Miller, Mechanicsburgh, Pa., assignor to Blue Bell, Inc., Greensboro, N.C.

Continuation of Ser. No. 11,183, Feb. 13, 1970, abandoned. This application Dec. 28, 1971, Ser. No. 213,177
Int. Cl. B65h 9/04
U.S. Cl. 271—59 17 Claims



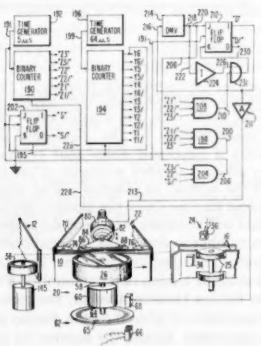
The present apparatus is for guiding an edge of the marginal portion of material or the edges of a pair of superposed pieces of material being fed along guiding members so that the edges are given a desired direction and in the case of superposed pieces of material the edges are in alignment and adjustably supported pneumatic means moves the material against said guiding members during the feeding and guiding thereof.

3,825,251

SYSTEM FOR CONTROLLING THE FEED OF DOCUMENTS INTO AND ALONG A DOCUMENT TRANSPORT PATH

Jack Beery, Farmington, and Gerald A. De Carteret, Detroit, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed July 2, 1973, Ser. No. 375,919
Int. Cl. B65h 3/52
U.S. Cl. 271—258 57 Claims



Disclosed is a control system for document transport mechanism including provisions for controlling the feeding, spacing, and throughput of documents, such as bank checks and the like, into and along a guideway leading from a hopper to discharge equipment which may be a stacker or a series of sorting pockets. The system is capable of operating purely synchronously, purely asynchronously or as a hybrid of the same. If purely synchronous operation is desired, the longest document by its length will determine the constant and maximum throughput rate for all other documents. For purely asynchronous operation, each document by its own length determines its own throughput rate. For hybrid operation, a standard document length can be aribtrarily selected whose own throughput rate will be the maximum and also the constant throughput rate for all other relatively sorter documents, and all documents relatively longer than the standard length will determine their own throughput rate by their length which will be less than the standard document's throughput rate.

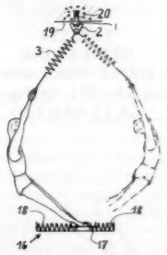
The system further includes speed retarding means that acts in a digital manner for close control of document speed in the guideway and effects a very efficient separation of overlapping documents due to the high acceleration-deceleration forces that are quickly built up and impressed against documents passing through. Additionally, the system includes various rollers disposed serially along the guideway having speed differentials which together with any subsequent documents length will determine the degree of interdocumental spacing between successive documents. More specifically, the document speed control instrumentality is comprised of a document feed roller disposed adjacent to the inlet of the guideway and a pressure actuator for applying pulsating forces on the documents as they are engaged and impelled by the drive roller into the guideway, such pressure pulses additionally acting to retard the speed of the drive roller to an acceptable document throughput rate.

3,825,252

SPRING-TYPE EXERCISER

Friedrich Geiger, Burgstrasse 1, 8901 Todtenweis, Germany

Filed Dec. 29, 1972, Ser. No. 319,167
Claims priority, application Germany, Dec. 30, 1971, 2165488; June 5, 1972, 2227239
Int. Cl. A63b 21/00, 23/02
U.S. Cl. 272—82 7 Claims

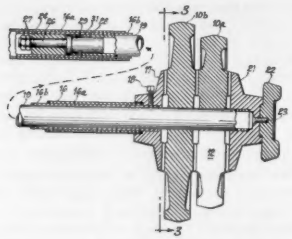


Two handles are attached to a bar which is suspended by a plurality of resilient members from an overhead support and which is within reach of an erect person who may grip these handles to perform oscillatory or gyrating body motions at a natural frequency determined by the spring constant and body mass; the feet of the user may be positioned on a spring-centered mobile base that is reciprocably mounted. The bar may be hollow to receive therethrough a cord made up of the resilient members. The resilient members may be attached at the respective ends of the bar. The bar may also be secured by resilient members at points on the overhead support that are spaced apart by a distance greater than the length of the bar.

3,825,253
BARBELL WITH REMOVABLE WEIGHTS

Henning J. Speyer, Chicago, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.

Division of Ser. No. 267,696, June 29, 1972, Pat. No. 3,771,785. This application Aug. 8, 1973, Ser. No. 386,532
Int. Cl. A63b 11/02
U.S. Cl. 272—84 7 Claims

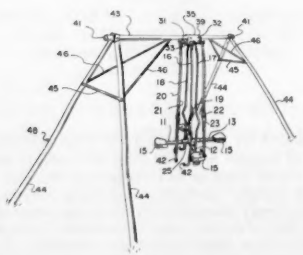


A barbell exercising device having weights adapted for mounting on a barbell. Each weight has a circular shape and a centrally disposed, axially aligned bore formed therein, and includes walls defining a radial slot extending from the bore to the periphery of the weight with the walls defining the slot being disposed at an angle with respect to the axis of the bore. The radial slot in each weight allows the weight to be mounted on a barbell and demounted therefrom without removing a collar or other weight retaining device by passing the barbell through the canted slot of the weight and then aligning the barbell with the axially aligned bore of the weight. A barbell is provided for supporting the weights which includes a hollow rod having flanges affixed to each of its terminal ends and a pair of bar members. Each bar member is partially, telescopingly insertable into the rod and has locking means affixed thereto for retaining each bar member in the hollow interior of the rod and retarding movement of the bar member axially of the rod. Protuberances formed on flanges positioned on the barbell, the rod and a weight form castellated mating surface portions capable of interengaging in antirotational relationship.

3,825,254
GLIDE SWING

Martin J. McGuire, 215 N.E. 90th, Seattle, Wash. 98115

Filed Nov. 18, 1971, Ser. No. 199,934
Int. Cl. A63g 9/00
U.S. Cl. 272—85 1 Claim

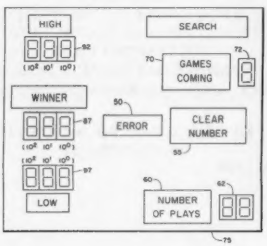


A glide swing is suspended from an overhead supporting structure or from its own supporting frame. It is mounted to provide a modified swinging and gliding ride to one or more persons riding below, depending on the number participating and/or the seating accommodations offered in a respective embodiment. In a preferred embodiment, the tops of upstanding seat hangers are secured above respectively in pairs, to one of two parallel and spaced rotatable shafts secured to the supporting structure for oscillating movements of themselves and the tops of the seat hangers whereas, the bottoms of these same upstanding seat hangers are secured below to seat supports for pivotal movements in a direction other than the direction of the oscillating movements. Each of these potential movements is modified to create the controlled glide swing motion. The modification is undertaken by providing an interplay structure located between the seats and respectively rotatably mounted to each seat. Because of this rotatable mounting of the seats during glide swing motions each seat slightly and controllably banks or tips to maintain the rider in a comfortable action position with respect to the arcuate motions and related forces of the glide swing. Yet at all times the glide swing remains under the control of the riders who can always ride safely.

3,825,255
NUMBER GUESSING GAME DEVICE

Thomas J. Kennard, 9160 N.W. East River Blvd., Coon Rapids, Minn. 55433, and Lawrence E. Moseman, 1444 Circle Dr., Burnsville, Minn. 55337

Filed Feb. 14, 1973, Ser. No. 332,326
Int. Cl. A63f 9/00
U.S. Cl. 273—1 E 17 Claims



A game device or apparatus of the electronic type where the concept of the game is to find a hidden and random number generated automatically by the electronic apparatus. The game includes a keyboard entry unit by means of which players may select a number in search of the hidden random number and the number so selected will be displayed on a numerical readout display. Once the number has been selected, a test command will compare the selected number with the hidden random number to determine the relationship of the same relative thereto. The selection can either be higher than, lower than, or equal to the hidden random number. If the selection is equal to the hidden random number, the game is completed with a win indication displayed on the display modules on the face of the apparatus. Should the number be higher or lower than the hidden random number, an indication will be provided on the display apparatus of this relationship and the number transferred from its initial position to a higher or lower register wherein it will be displayed. As the game progresses, and after initial selections, the selected number, when found to be higher or lower than the hidden random number will be compared with the next previous selection of a higher or lower number so that its relationship relative to the previous numbers which are stored and displayed on the dis-

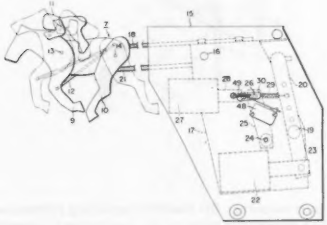
play modules must be closer to the hidden random number than the previous number or an error situation exists and no transfer of the selected number as a new high or low selection takes place. The keyboard entry unit provides for a clear command to clear the error in the selected number by removing the same from the main keyboard register in the display modules and permits a new try or selection by the player in the search for the random number. The keyboard selection entries together with the logic control operating the display modules are all in binary coded decimal form. The hidden random number is generated by a continuously running clock apparatus whenever the game is energized but not in operation and is determined by initial operation of a keyboard entry unit at the start of a game.

3,825,256

DEVICE FOR SIMULATING A RUNNING ANIMAL

Shikanosuke Ochi, Tokyo, Japan, assignor to Kabushiki Kaisha Sega Enterprises, Tokyo, Japan

Filed Feb. 16, 1973, Ser. No. 332,789
Claims priority, application Japan, July 6, 1972, 47-79187
Int. Cl. A63f 9/00, 9/14
U.S. Cl. 273—1 E **5 Claims**



A device for simulating a running animal is disclosed. The device comprises a cabinet, an endless belt located in the cabinet and having a plurality of obstacles located on the outer surface thereof and a movable model. The model has first and second legs which are adapted for reciprocal motion relative to each other. The model oscillates in a vertical plane as the legs are activated to simulate galloping. A jump mechanism is adapted to cause the model to rapidly rise and separates the legs thereof when activated. The jump mechanism may be manually activated for causing the model to rise to a maximum height by synchronizing the actuation of the jump mechanism with the periodic oscillation of the model in the vertical plane.

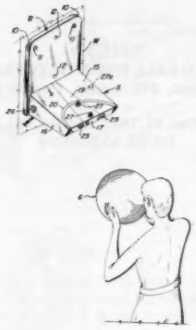
3,825,257

APPARATUS FOR PRACTICING BASKETBALL THROWS

George L. Palmer, Box 1316, Sheridan Lake, Colo. 81071

Filed Oct. 19, 1973, Ser. No. 407,915
Int. Cl. A63b 63/02
U.S. Cl. 273—1.5 A **9 Claims**

The invention is a basketball practice apparatus which combines a backboard and an outstanding shelf at the base of the backboard. This unit may be mounted against a wall or upon a post at any suitable height. Tripping switches at selected locations on this shelf will actuate light or sound signals to indicate that a basketball tossed against the practice apparatus is accurately thrown. The practice apparatus may be marked in any suitable manner to help a player aim a basketball against the apparatus.

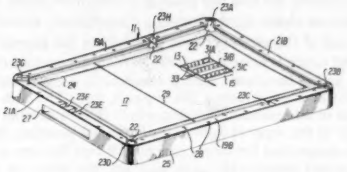


3,825,258

FLOOR TYPE BILLIARD GAME WITH COMPENSATING POCKET DENSITY ARRANGEMENT

E. Michael Frierman, 217 Martha Lee Dr., Hampton, Va. 23366

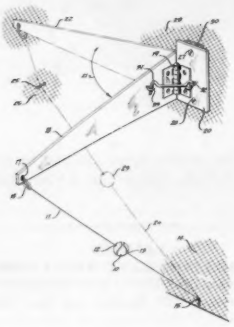
Filed Mar. 17, 1972, Ser. No. 235,493
Int. Cl. A63d 15/00
U.S. Cl. 273—2 **5 Claims**



A floor-type billiard game is described wherein a rectangular playing surface has a length dimension range of from 8 to 12 feet, a width dimension range of from 6 to 8 feet and a length-to-width ratio of less than 2. Playing balls for the game are approximately the same size and composition as standard billiard balls. There are two oppositely-disposed, off-center side pockets which are closer to a spotting end of the playing surface than to a scratch-line end, and two side-by-side center end pockets at a scratch-line end of the playing surface. This pocket arrangement provides for a pocket density which compensates for the relatively large size playing surface. A spotting rack, which is used to rack balls at the spotting end of the playing surface has a plurality of parallel compartments for racking balls in separated parallel rows. The rack incorporates a device for transporting balls within the rack. A removable boundary is provided for dividing the normal playing surface into a smaller playing area. Rounded ball deflectors are positioned in boundary pocket breaks for deflecting balls driven into the breaks downwardly into pocket openings. A protective covering protects a seam between cushions and boundary frames. A game-mallet head is made of steel. At one end thereof, there is a flat striking surface and at the other end thereof, there is a smaller "tip" striking surface. The tip end has a resilient covering thereon. The flat end also has a cover-

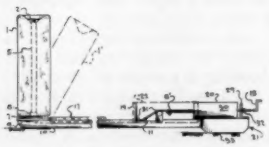
ing to protect a cue ball from damage. The tip end also has a centered aiming edge which is used by players to align the striking tip with balls. A removable spin peg is mountable on the mallet head for use to impart additional spin to a struck cue ball.

3,825,259
TETHERED BALL FOR SPORTS PRACTICE
Paul James Burchett, 410 Acacia, Corona Del Mar, Calif. 92625
Filed Dec. 11, 1972, Ser. No. 261,734
Int. Cl. A63b *69/38*
U.S. Cl. 273—29 A **1 Claim**



A tethered ball tennis practice device having a support arm pivotally attached at one of its ends to a vertical support surface whereby the arm will pivot in a horizontal plane. A tennis ball has an elastic cord extending diametrically therethrough. One end of the elastic cord is attached to the support arm at the end which is remote from the vertical support surface. The other end of the elastic cord is attached to the vertical support surface at a point below the support arm. The arm may be locked in an extended position which is substantially perpendicular to the support wall. In the extended position, the tennis ball is suspended for tennis practice. When the arm is pivoted to a stored position the arm, ball and the tether lie substantially against the vertical wall. The device may also be locked in the stored position.

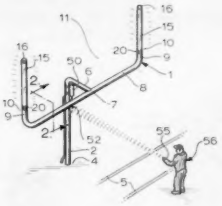
3,825,260
MOBILE, VARIABLE RESISTANCE FOOTBALL PRACTICE DUMMY
John D. Thomas, Sr., Rt. 2, Box 104X, Bogalusa, La. 70427
Filed Apr. 11, 1972, Ser. No. 242,983
Int. Cl. A63b *67/00*
U.S. Cl. 273—55 R **8 Claims**



A mobile football practice blocking and tackling dummy comprising a padded dummy rotatably mounted on a vertical support element, whose lateral resistance is variable, and a laterally extended base support and stablizing arm on which is positioned a crank-operated, variable resistance system. The resistance and righting force of the dummy is controlled by a spring loaded tension cable, the tension of which is varied by altering the compression of a high-strength spring attached to one end of the cable. By rotating the crank arm, the tension on the cable through the spring is changed which alters the righting force and resistance of the vertical dummy to lateral forces such as occur in football blocking and tackling practice.

In use, when approached in line from and along the lateral support arm, the mobile practice dummy will move straight ahead; while, when approached from the opposite direction, the practice dummy will move from side to side as it is driven back, providing practice in lateral stability as well as driving for the football player.

3,825,261
FOOTBALL LIGHTED GOAL POSTS
Nick G. Zapos, 2142 N. Latrobe Ave., Chicago, Ill. 60639
Filed Aug. 20, 1973, Ser. No. 390,003
Int. Cl. A63b *67/00*
U.S. Cl. 273—55 R **10 Claims**

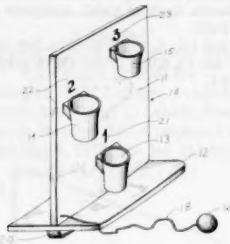


A goal post structure for football including referee-actuatable signaling device for lighting the goal posts to signal a goal. The goal post structure comprises a vertical ground-engaging center post having a horizontal tubular member attached to the upper end of the center post and a vertically extending post or upright attached to each end of the horizontal tubular member; each upright comprises a plastic translucent shield having a bulb mounted therein. Mounted on the ground engaging center post and connected to the bulb is a radio receiver and a timer connected such that a referee may activate an electrical circuit by means of a remote transmitter. The timer is utilized in deactivating the electrical circuit after a predetermined time.

3,825,262
HAND-HELD AMUSEMENT DEVICE WITH TETHERED BALL AND PLURAL TARGETS
Andrzej Grzybowski, and Alicja Grzybowski, both of 340 Lake Merced Blvd. 8, Daly City, Calif.
Filed Aug. 13, 1973, Ser. No. 387,896
Int. Cl. A63b *71/02*
U.S. Cl. 273—97 R **5 Claims**

A hand-held amusement device having a base member and a vertical support member arranged at substantially right angles to the base member. A plurality of basket-like containers are secured to one face of the support member in a prearranged pattern and numbered in correspondence with their degree of difficulty. A small ball is attached to a lower corner of the vertical support member by means of a string to restrain the ball to the vicinity of the toy. An elastic band is attached to the outer underside portion of the base member to enable the toy to be attached to the user's hand. In use, the ball is rested

in the palm of the hand and hurled upwardly while at the same time the toy is manually maneuvered to attempt to catch the



ball in a basket. For successful attempts, points are awarded on the basis of the basket number.

3,825,263

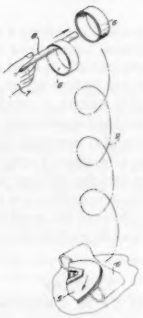
ROD AND RESILIENTLY PROJECTED RING

Joseph Santangelo, 362 Prospekt Ave., Bridgeport, Pa. 19405

Filed Oct. 19, 1972, Ser. No. 299,012

Int. Cl. A63b 71/04

U.S. Cl. 273—100 **4 Claims**



The game device includes a circular band of a resilient material such as plastic, and a rod. The resilient member is placed on the ground or floor and the toe-portion of the shoe is then pressed down on it from above and moved to the rear. This compresses the resilient member and when the shoe tip slides far enough backward that it is free of the member, the resilient member jumps into the air whereupon the player attemps to place the rod through the aperture in the resilient member while it is still in the air.

3,825,264

MINIATURE TABLE MODEL SHUFFLEBOARD AND SHUFFLEBOWLING GAME

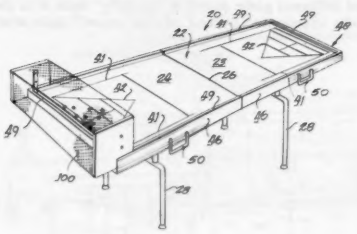
Arthur L. Dockum, 628 N. Circle Dr., Colorado Springs, Colo. 80909

Filed Aug. 27, 1973, Ser. No. 391,961

Int. Cl. A63d 3/00

U.S. Cl. 273—126 R **9 Claims**

A portable readily transportable combined shuffleboard and shufflebowling game for selectively playing either the game of shuffleboard or the game of shufflebowling which is played in a manner analogous to regular bowling but utilizes a bowl shaped member in place of a bowling ball which is propelled down the alley by a cue such as used when playing shuffleboard, there being provided a collapsible cage adapted to be detachably attached to the end of the game table behind the normal placement of the bowling pins thus providing a



combined backstop and collecting tray disposed behind and beneath the end of the game board for catching any pins leaving the game table after being struck by the bowl member during the play of shufflebowling.

3,825,265

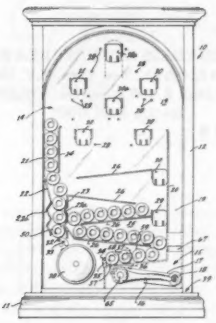
AMUSEMENT MACHINE

Alan R. Pitkanen, Manhattan Beach; Melvin R. Kennedy, Harbor City; Dietmar Nagel, Redondo Beach; William J. Gross, and Denis V. Bosley, both of Palos Verdes Peninsula, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Nov. 5, 1973, Ser. No. 412,924

Int. Cl. A63f 3/00

U.S. Cl. 273—126 R **14 Claims**



An amusement machine featuring a vertically disposed playing surface wherein perforated tokens or slugs are propelled upwardly so as to descend into a plurality of slots or reservoirs. The machine includes a jackpot reservoir, a jackpot payoff slot, a predetermined number payoff reservoir, and a plurality of predetermined number payoff slots. A propelling mechanism propels only perforated tokens or slugs, and it automatically rejects and returns coins or imperforated slugs.

3,825,266

ELECTRONIC GAME OR EDUCATIONAL DEVICE

James D. Bissell, Rt. 1, Pfafftown, N.C. 27040

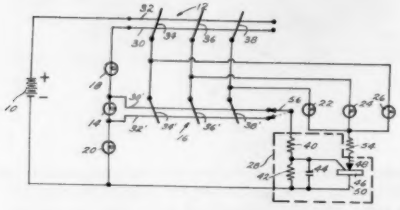
Filed Jan. 5, 1973, Ser. No. 321,384

Int. Cl. A63f 9/14

U.S. Cl. 273—130 AB **15 Claims**

A game or educational device is provided employing an electronic circuit for enabling selection by a first player of one of a plurality of possible game plays. A "ready" light is pro-

vided in the circuit for indicating when selection of a game play by the first player has been accomplished. Switches are also provided for enabling selection by a second player of one of a plurality of possible game plays, and a "move" light is provided for indicating when the first and second players have selected different game plays. A "penalty" light is in the circuit to be illuminated instead of the "move" light when the



first and second players select the same game play, and additional indicator lamps are provided for indicating the play selections of the players. A "lock-out" feature may also be employed whereby the second player must make his play selection within a predetermined time after the first player's selection and after illumination of the "ready" light, or the additional indicator lamp associated with the second player's selection will not light.

3,825,267

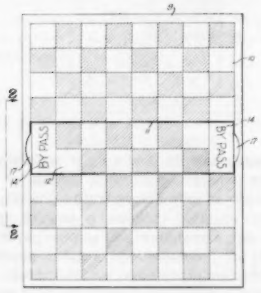
EXPANDED CHESS AND CHECKER BOARD

Mark Rubinoff, 60 E. 9th St., New York, N.Y. 10003

Filed Mar. 8, 1973, Ser. No. 339,229

Int. Cl. A63f *3/00*

U.S. Cl. 273—131 B **5 Claims**



A game board for the playing of checkers, chess and the like has two removable and replaceable central rows of squares. Some of these squares carry different inscriptions forbidding the movement of the pieces thereon under the playing rules. The removable rows may be located upon panels, sheets, films or the like. Their number and location can be varied. Games can be varied to the greatest extent by the use of differently located movement forbidding squares.

3,825,268

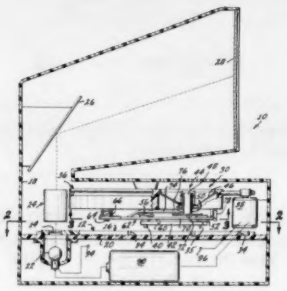
SELECTABLE PLAY MECHANISM FOR STATIONARY RECORD

Andrew M. Holland, Los Angeles, and William B. Pester, Palos Verdes Peninsula, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed July 6, 1972, Ser. No. 269,335

Int. Cl. G03b *31/06*; **G11b** *3/40*

U.S. Cl. 274—9 C **10 Claims**



A simple toy phonograph for playing a stationary record of the type which has several interleaved spiral grooves with lead-in portions circumferentially spaced about the record. A rotatable carrier carries a tone arm whose stylus can enter any of the grooves, and also carries a mechanical speaker assembly whose piston is biased against the tone arm to pick up vibrations from it. A cam also mounted on the rotatable carrier is moved by the tone arm when it enters the end of a spiral groove, so that the cam lifts the speaker piston away from the record, to allow the tone arm to lift from the record and pivot to a position over the outside of the record where the tone arm can drop into another lead-in portion of a record groove.

3,825,269

SHUT-OFF DEVICE FOR A RECORD CHANGER

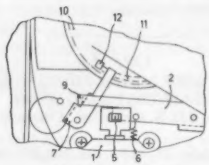
Kurt Eisemann, Berlin, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 13, 1972, Ser. No. 243,638

Claims priority, application Germany, May 25, 1971, 2125708

Int. Cl. G11b *17/08*

U.S. Cl. 274—10 R **5 Claims**



Shut-off device for a record changer in which one end of an initially tensioned leaf spring is secured in a switch-off track of a cam disc designed as a control mechanism. The other end of the leaf spring projects through an opening in the cam disc. A

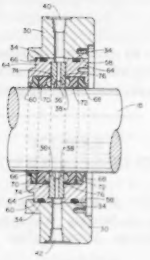
follower pin when travelling along the switch-off track thrusts the free spring end through the opening in the cam disc. This free spring end operates the on-off switch which is provided with mechanical time delay elements.

3,825,270

WIPER SEAL FOR APPARATUS SUCH AS METALLIC CAN BODY FORMERS

Elpidifor Paramonoff, Los Angeles; Frederick C. Olsen, Huntington Beach, and Robert C. Labeda, Buena Park, all of Calif., assignors to Standum, Inc., Compton, Calif.

Filed May 9, 1972, Ser. No. 251,802
Int. Cl. F16j *15/32, 15/40*
U.S. Cl. 277—15 **8 Claims**



The ram of a can body former has a bearing oil flowing thereon at one side of a wiper seal and metal forming liquid at the opposite side thereof. The wiper seal includes an outer housing portion mounting an inner housing ring axially slideably removable therefrom with sealing means therebetween. The inner housing ring, in turn, mounts a manifold ring forming a manifold chamber surrounding the ram with single or multiple sealing rings at opposite sides of the manifold ring slideably engaging the ram. A pressure fluid inlet into the manifold chamber maintains a fluid pressure therein and a fluid bleed-off from the manifold chamber constantly bleeds off a portion of the pressure fluid having mixed therein quantities of the bearing oil and forming liquid bypassing the seals during ram reciprocal movement. The mounting of the manifold ring and sealing rings within the inner housing ring permits the entire assembly to be axially slideably removed as a unit from the outer housing portion.

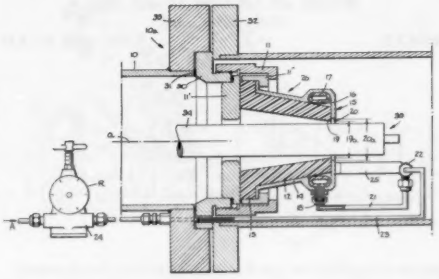
3,825,271

FLUID SEALING DEVICE FOR ELECTRIC CABLE CURING APPARATUS

Aldo Bellastio, Milan, Italy, assignor to Industrail Pirelli Societa per Azioni, Milan, Italy

Filed Jan. 10, 1973, Ser. No. 322,453
Claims priority, application Italy, Feb. 3, 1972, 160/72
Int. Cl. F16j *15/46*
U.S. Cl. 277—34.3 **6 Claims**

A sealing device for controlling the water flow from between a cable sheath and the end of a sheath curing tube as the cable passes through the tube, the sealing device comprising a frusto-conical elastic sleeve having its larger inner diameter larger than the sheath diameter and its smaller inner diameter approximately equal to that of the cable sheath. Most of the exterior surface of the sleeve is covered by a rigid sleeve shaped like the elastic sleeve but having a portion spaced from the smaller diameter end of the elastic sleeve to form a chamber which receives an air expandible elastic member in the shape of a toroid to vary the diameter of the elastic sleeve opening. The rigid sleeve also covers most of the smaller diameter end of the elastic sleeve to hold the latter in



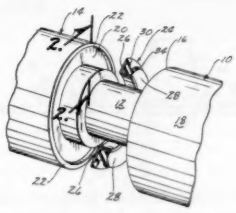
place but has an opening larger than the maximum sheath diameter to be processed.

3,825,272

FACE SEAL FOR FOOD PROCESSING EQUIPMENT

Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Filed May 19, 1971, Ser. No. 144,879
Int. Cl. F16j *15/34*
U.S. Cl. 277—94 **1 Claim**



A face seal which is especially well adapted for use in food processing equipment is disclosed herein. A rotatable member such as a toothed roll has its opposite ends rotatably journaled in bearing members having an annular groove formed therein. The annular grooves are positioned adjacent the ends of the rotatable member and are in communication with the outer periphery of the bearing member. A lip element overhangs and extends around and partially over each of the annular grooves to partially enclose the same. A resilient sealing element is positioned in the annular groove and engages the rotatable and bearing members to form a face seal therebetween. At least one-half the thickness of the sealing element is exposed to view from beyond the outer periphery of the bearing member to permit visual inspection and cleaning of the exposed portion of the sealing element.

3,825,273

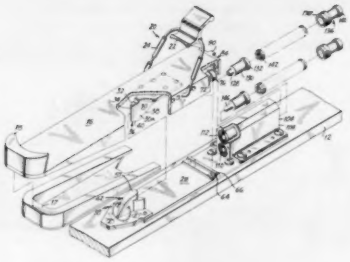
SKI BINDING

Leonard M. Greene, c/o Safe Flight Instrument Corp., P.O. Box 550, White Plains, N.Y. 10514

Filed June 7, 1971, Ser. No. 150,677
Int. Cl. A63c *9/08*
U.S. Cl. 280—11.35 K **25 Claims**

A ski binding including a sole plate to which a ski boot is secured. The sole plate is supported on a ski plate for rotatable movement of the sole plate about forward pitch and yaw axes located beneath a skier's center of gravity. Means is provided

for preventing movement of the sole plate relative to the ski plate about these axes when subjected to pitching and yawing

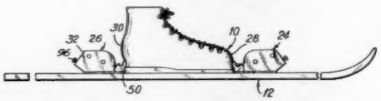


torques occurring during normal maneuvers and for allowing said sole plate to be released for settable abnormal (excessive) pitching and/or yawing torques.

3,825,274
SKI BINDING WITH AUTOMATIC BOOT-TO-SKI RETURN

Burton Alan Weinstein, New York, N.Y., assignor to National Recreation Industries, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 90,361, Nov. 17, 1970, abandoned. This application May 22, 1972, Ser. No. 255,375
Int. Cl. A63c 9/08
U.S. Cl. 280—11.35 N **27 Claims**



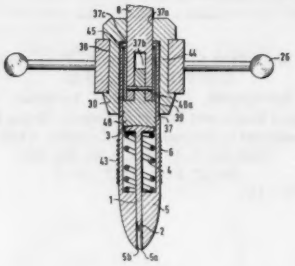
A safety-type binding in which spring-actuated drums are rotatably mounted on the ski adjacent the heel and toe to pay out and retract elongated, flexible leashes connected to the boot. In a skiing phase of operation, the binding yieldably holds the boot in the normal skiing position and permits limited shock-absorbing movement in which the leashes are payed out slightly under decreasing resistance. If forces in excess of a preselected safe level are applied and cause relative movement beyond the shock-absorbing range, the binding shifts to a release phase to permit more of the leashes to be payed off of their respective drums and the boot and ski to move relatively freely away from one another, while the ski remains leashed to the boot. The leashes are retracted and the boot and ski are drawn back together when the separation forces have abated and, once they are proximate one another, the binding automatically shifts back to the skiing phase to further retract the leashes and bring the boot back into the skiing position.

3,825,275
SKI POLE

Ernst Klemm, Lautenbacher Strasse 16-18, Gernsbach, Germany

Filed Oct. 2, 1972, Ser. No. 293,837
Claims priority, application Germany, Nov. 3, 1971, 2154628
Int. Cl. A63c 11/22
U.S. Cl. 280—11.37 N **19 Claims**

A ski pole comprises a nail-shaped spike movably mounted relative to a profiled end member and adapted to be moved, when a load is exerted onto the ski pole, into a position protruding from said end member, whereby said spike, with the ski pole unloaded, is retained by means of a spring in its

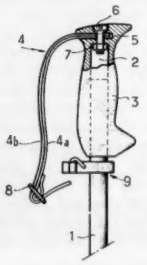


position concealed by the end member, and comprising a sleeve member being longitudinally movably connected with the lower end of the ski pole shaft by positive engagement.

3,825,276
SKI-STICK AND ASSOCIATED LOOPED CARRIER STRAP

Robert Witsenhausen Adelmann, Saint Vallier Sur Rhone, France, assignor to Societe Anonyme de Recherches de Mecanique Appliquee, Saint Vallier sur Rhone (Drome), France

Filed Nov. 22, 1972, Ser. No. 308,847
Claims priority, application France, Nov. 24, 1971, 71.42089
Int. Cl. A63c 11/22
U.S. Cl. 280—11.37 H **3 Claims**



The handle of the ski-stick carries adjacent the lower end of the handle, a fastener provided with a port. Thus, a looped two-stranded strap which can be secured solely to the upper end of the handle, may as well extend as a half-loop between the upper end and the fastener through the port in which the free end of at least one strand of the strap is introduced, so as to be held in position thereby. This allows the skier to insert his hand between the handle he grasps and the half-loop formed by the strap.

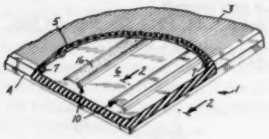
3,825,277
MAT SWITCH

Clarence I. Steinback, Edina, Minn., assignor to Acrometal Products, Inc., Minneapolis, Minn.

Filed Aug. 16, 1973, Ser. No. 388,993
Int. Cl. H01h 13/16
U.S. Cl. 200—86 R **6 Claims**

A flexible casing of electrical insulating material, having spaced top and bottom walls and a peripheral wall enclosing a

pair of spaced apart electrical conductor plates. An elongated spacer strip of flexible resilient electrical conducting material is disposed between the conductor plates, the strip being secured along a longitudinally extended transversely central portion to one of the conductor plates, but insulated therefrom, by a band of insulating material. The strip includes



a pair of longitudinally extending flanges at opposite edges of the strip, the flanges diverging toward the opposite conductor plate, the outer edge portions of the flanges engaging the other conductor plate. Downward movement of the top wall and top conductor plate bends one or more of the flanges, so that the flanges engage both conductor plates to close an electrical circuit.

3,825,278

PASSENGER PROTECTIVE INSTALLATION FOR VEHICLES, ESPECIALLY FOR MOTOR VEHICLES

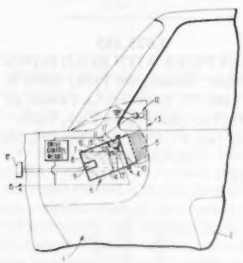
Gerhard Schiesterl, Stuttgart, and Helmut Wolf, Nellingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Mar. 24, 1972, Ser. No. 237,641

Claims priority, application Germany, Mar. 25, 1971, 2114475

Int. Cl. B60r *21/08*

U.S. Cl. 28—150 AB **1 Claim**



A passenger protective installation for vehicles, especially motor vehicles which includes at least one air bag that is adapted to be inflated by means of a pressure gas when exceeding a predetermined deceleration value of the motor vehicle, whereby the pressure gas is produced from liquefied gas in a pressure gas producer that includes a tank for the liquefied gas; a float with an electrically conductive surface is arranged in the tank to which are coordinated contact surfaces separated from one another which, in relation to the liquid level, converge toward one another in the downward direction at least within the upper area thereof and which are so arranged that the float abuts at the contact surfaces when the liquid level is disposed below the predetermined minimum level of the electrically non-conductive liquid gas; the abutment of the float at the contact surfaces thereby closes a circuit which includes or operates an indicating and/or control device.

3,825,279

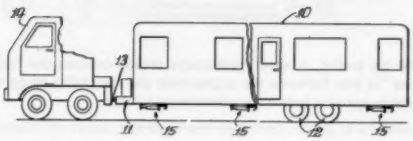
TRAILER JACK SUPPORT MEANS FOR MOBILE HOMES

Edmund E. Schmeichel, St. Joseph, Mich., assignor to Edmund D. Schmeichel, St. Joseph, Mich.

Filed June 22, 1972, Ser. No. 265,350

Int. Cl. B60s *9/02*

U.S. Cl. 280—150.5 **5 Claims**



Means for supporting a mobile home permitting the setting up of the mobile home quickly and substantially permanently during the time the mobile home is maintained at a given location. The support means are selectively disposable in a retracted position or in the mobile home supporting position while being permanently connected to the mobile home at all times.

3,825,280

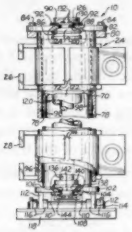
ADJUSTABLE STABILIZER SUPPORT FOR VEHICLES

Jimmy D. Myers, Morton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 27, 1973, Ser. No. 391,548

Int. Cl. B60s *9/10*

U.S. Cl. 280—150.5 **6 Claims**



An adjustable stabilizer support for a vehicle selectively engageable with a support surface for stabilizing the vehicle when subjected to external loading includes an axially fixed elongated guide member supported on the vehicle with a leg member disposed in relatively extendible guided relation on the guide member wherein elevationally spaced spherical bearing sockets are formed on the guide and leg members and an extensible retractable fluid motor having spherical bearing surfaces formed on the opposite ends thereof is disposed for self-aligning load bearing contact with the spherical bearing sockets when the leg member is extended into engagement with the support surface by extension of the fluid motor.

3,825,281

TRAILER COUPLING MEANS

Durrell U. Howard, 306 Krameria, San Antonio, Tex. 78213

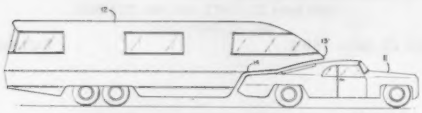
Filed Nov. 12, 1971, Ser. No. 198,378

Int. Cl. B62d *53/06*

U.S. Cl. 280—423 R **9 Claims**

The disclosure relates to a means of coupling a trailer to an automobile wherein the weight of the trailer carried by the coupling means is distributed and carried by the automobile at a point adjacent to or forward of its rear axles. A self-aligning and shock-absorbing coupling means is also disclosed. The

coupling means uses a fifth wheel and spring-loaded roller-detent means to maintain alignment in yaw between the vehicle



and the trailer. A speed-responsive means reduces the "stiffness" in yaw between the automobile and the trailer when the vehicle speed is below a predetermined value.

3,825,282

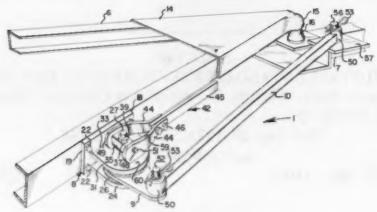
SWAY CONTROL FOR TRAILERS

John W. Meinholdt, 1900 Central, Topeka, Kans. 66608

Filed Jan. 2, 1973, Ser. No. 320,284

Int. Cl. B60d *1/00*

U.S. Cl. 280—446 B **4 Claims**



A sway control device for trailers and the like comprising a brake member secured to a portion of the trailer and having means for selectively activating brake shoes thereon. A link is universally mounted on and extends between the brake shoe member and the towing vehicle and is operable to activate a brake arm member frictionally engaging the brake shoes for resisting turning and swaying of the trailer in response to turning of the towing vehicle and/or wind gusts striking the trailer.

3,825,283

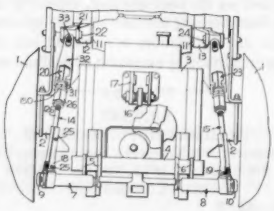
ADJUSTABLE LINK WITH LOCKING WRENCH FOR A TRACTOR THREE-POINT HITCH

Kenneth N. Hansen, Waukesha, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed June 4, 1973, Ser. No. 366,869

Int. Cl. B60d *1/14*

U.S. Cl. 280—461 A **10 Claims**



An adjustable link of a three-point hitch on a tractor for adjustably raising and lowering the lower draft arms or extending the upper link of a three-point hitch. A wrench member is carried on the link to adjust the length of the link and lock the link at its adjusted length.

3,825,284

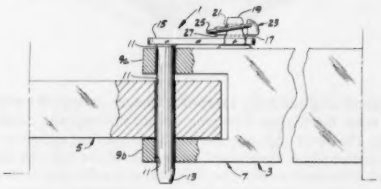
SAFETY HITCH PIN

Clyde J. Behrle, Perryville, Mo., assignor to Bill G. Bailey, Perryville, Mo., a part interest

Filed Oct. 11, 1973, Ser. No. 405,565

Int. Cl. B60d *1/02*

U.S. Cl. 280—515 **4 Claims**



A safety hitch pin for coupling the tongue of an implement, such as a farm wagon or the like, to a towing vehicle. The safety hitch pin includes a hitch pin, a bar secured to one end of the hitch pin, a hole in the bar spaced from the hitch pin, a stud secured to one face of the tongue of the implement and spaced from the hitch pin holes in the tongue a distance corresponding to the distance the hole in the bar is spaced from the hitch pin. The stud has a transverse hole therethrough so that with the hitch pin inserted in the hitch pin holes in the implement tongue, the stud is received by the hole in the bar. A safety retaining pin insertable through the transverse hole has a pivotally movable retainer ring for locking the retaining pin relative to the stud thereby to prevent removal of the retaining pin and to positively prevent withdrawal of the hitch pin from the tongue of the implement, thus preventing inadvertent uncoupling of the implement and the towing vehicle.

3,825,285

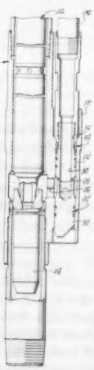
TUBING STINGER WITH HOLD DOWN RING

Ralph F. McArthur, Huntington Park; Melle F. Geurts, Los Angeles, and John M. Kelleher, La Palma, all of Calif., assignors to Kobe, Inc., Huntington Park, Calif.

Filed July 17, 1972, Ser. No. 272,386

Int. Cl. F16l *39/00*

U.S. Cl. 285—27 **2 Claims**



Two parallel tubing strings are suspended in a well and respectively carry at their lower ends a bottom hole assembly

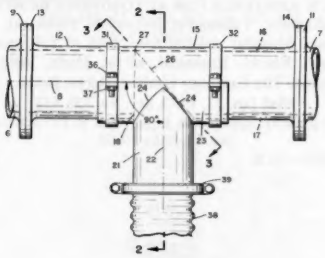
and a stinger adapted to be stabbed into a socket in the bottom hole assembly. A hold down ring on the stinger and engageable with the wall of the socket resists withdrawal of the stinger from the socket with a force which is large compared to that required to insert the stinger into the socket. If resistance to further movement is encountered when running the stinger-equipped tubing string in, it can be readily determined whether such resistance is due to insertion of the stinger into its socket, or is due to some other obstruction. In other words, if the pull out force is high compared to the run in force experienced just before termination of tubing string movement, stabbing of the stinger into its socket was achieved, in which case the stinger is reinserted. However, if the pull out force is small, then the termination of tubing string movement was due to some other obstruction.

3,825,286

PIPING CONNECTOR

Calvin Scott Henry, III, Umpqua, Oreg., assignor to Winery Systems, Inc., Folsom, Calif.

Filed Jan. 8, 1973, Ser. No. 321,756
Int. Cl. F16l *35/00*
U.S. Cl. 285—93 **10 Claims**



A piping connector includes a primary pipe of predetermined internal diameter, having a primary axis and having an opening through the pipe wall with a transverse dimension about equal to the primary internal diameter. A saddle is adapted to be removably clamped to one side of the primary pipe overlying the opening. A secondary pipe of an external diameter about equal to said internal diameter and having a secondary axis extends through the saddle and is secured thereto with the secondary axis intersecting the primary axis at a predetermined angle. The end of the secondary pipe within the primary pipe terminates in a curve with an opening on one side and in possible other ways and in one case terminates in a plane bisecting the minimum angle between the primary and secondary axes. Preferably, a flexible hose is secured to the outside end of the secondary pipe.

3,825,287

HIGH PRESSURE MANIFOLD COUPLING MEANS

Rodney R. Erickson; Donald L. Hopkins, both of Joliet, and William B. Norick, Dunlap, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 1, 1972, Ser. No. 302,775
Int. Cl. F16l *39/00*
U.S. Cl. 285—137 R **8 Claims**

A high pressure fluid coupling means provides a fluid tight connection between two separable members in a fluid circuit while concurrently allowing slight axial and lateral misalignment between such members. An expansible, flexible seal ring provides sealing with movement accommodation while a rigid back-up ring abuts said expansible, flexible seal ring to prevent it from dislodging from the coupling under the influence of high fluid pressure. The coupling mean is used to

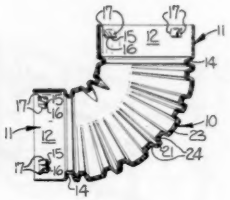
connect the respective inlet and outlet manifolds in a hydraulic motor-pump set.

3,825,288

FITTING FOR CORRUGATED PLASTIC PIPE

Ernest J. Muroschak, Box 878, Roseboro, N.C. 28382

Filed Nov. 29, 1972, Ser. No. 310,480
Int. Cl. F16l *41/00*
U.S. Cl. 285—156 **7 Claims**



A plastic fitting for corrugated plastic drainage or irrigation pipe. The fitting comprises a corrugated tubular body portion and couplings integrally formed with the body portion at the ends thereof, each coupling including a relatively thin-walled flexible annular sleeve adapted for receiving an end of a length of corrugated plastic pipe therein and also including a plurality of wedge-shaped latching members integrally formed on the sleeve and having a relatively rigid camming surface facilitating insertion of an end of a corrugated pipe in the sleeve. The thin-walled sleeves are extremely flexible and permit independent movement of the latching members relative to each other when the sleeve is flexed during insertion of a pipe in the sleeve. The fitting is capable of receiving and connecting corrugated plastic pipes even though they vary somewhat in external diameter.

3,825,289

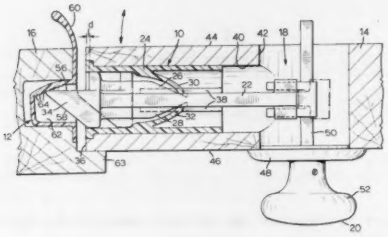
LATCH BOLT AND KEEP ASSEMBLY

Richard James Armstrong, Toronto, Ontario, Canada, assignor to Decalock Limited, Toronoto, Ontario, Canada

Filed June 27, 1972, Ser. No. 266,571
Claims priority, application Canada, June 15, 1972, 144,774
Int. Cl. E05b *15/02*; E05c *21/00*
U.S. Cl. 29—2 **1 Claim**

The invention relates to the combination of a latch bolt and latch keep having co-operating structure for holding a door closed, and more particularly to a latch bolt and latch keep combination which when fitted respectively to a door and

door frame provide limited adjustment to close the door more tightly should the door rattle. The latch keep includes a series



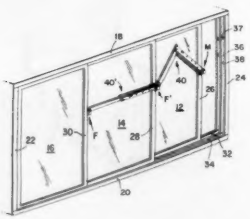
of steps for selective engagement by an end portion of the latch bolt to retain the door in a closed position.

3,825,290

SLIDING DOOR LOCK BAR APPARATUS

Victor J. Messina, 6749 Ixora Dr., Miramar, Fla. 33023, and Richard J. Messina, 1322 N.W. 188th Ter., Miami, Fla. 33169

Filed July 13, 1972, Ser. No. 271,368
Int. Cl. E05c *17/04*
U.S. Cl. 292—262 **8 Claims**



A sliding door security lock is provided comprising at least one pair of rigid bars hingedly secured to each other. Where there is only one sliding panel in the door, one end of one of the bars is rigidly secured to a non-movable portion of the frame. The furthest end of the other bar is rigidly secured to the frame of the slidable panel. The two remaining adjacent ends of the two bars are pivotally secured to each other. When there are two sliding panels in the door, there will be two pairs of the hinged bars having the same general arrangement as described hereinabove with the adjacent ends of each of said pair of bars being hingedly secured to each other as well as to the frame of the second slidable glass panel. The hinged bars are arranged to fold in order to permit the door to open and to automatically lock in an unfolded or linear condition in order to maintain the door closed.

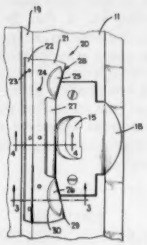
3,825,291

TAMPER SHIELD FOR SPRING BOLT LOCK

Ivan F. Sprunger, 729 W. Seventh St., Seymour, Ind. 47274

Filed Dec. 14, 1972, Ser. No. 315,078
Int. Cl. E05b *17/00*
U.S. Cl. 292—346 **2 Claims**

A shield mountable to a door jamb to prevent tampering with the bolt lock of the door. The shield includes a mounting plate with a pair of walls integrally joined together at a right angle with each wall being fixedly secured to the door jamb. A third wall is integrally connected at an acute angle to one of the walls forming a stop to prevent passage of a burglary tool through the gap between the door and door jamb. A pair of end tabs are integrally mounted to the plate at a position above and below the bolt of the door. The stop and end tabs are spring biased to an original position and will return to the



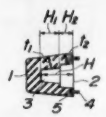
original position after the door is closed and opened. The outer distal ends of the stop and end tabs are beveled or turned inwardly to prevent the shield from snagging on the door as it is opened.

3,825,292

SHOCK ABSORBER FOR AUTOMOBILE BUMPERS

Kihei Nakamura, Yokohama; Harumichi Yamazaki, Tokyo; Hirotsugu Masuda; Takeshi Sato, both of Yokohama, and Yoshinori Kiuchi, Itsukaichi, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Jan. 31, 1973, Ser. No. 328,432
Claims priority, application Japan, Feb. 9, 1972, 47-16368
Int. Cl. B60r *19/06*
U.S. Cl. 293—71 R **1 Claim**



A shock absorber for automobile bumpers comprising a hollow rubber body with a trapezoidal cross section, with closed top and side walls and an open bottom. The hardness of the rubber material and the t/H ratio (t being the side wall thickness and H being the height of the trapezoidal hollow space) are such that the differential of the rate of increase of the load of the shock absorber for an increase of the deflection thereof is negative. Preferably, the t/H ration is not smaller than 0.2 but not greater than 0.5.

3,825,293

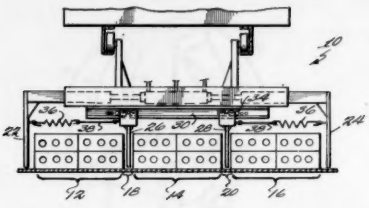
BRICK GRIPPING APPARATUS

Josef Schwarz, Vohringen/Iller, Germany, assignor to Lingl Corporation, Paris, Tenn.

Filed July 27, 1973, Ser. No. 383,198
Int. Cl. B66c *1/30*
U.S. Cl. 294—63 R **6 Claims**

Apparatus for gripping a column of block-shaped articles such as bricks arranged in an end-to-end relationship to one another with at least some of the articles being initially spaced from one another to form at least one corresponding intermediate gap in the column. Intermediate tongues are provided for insertion into the intermediate gaps thus providing intermediate support for the gripped column. The intermediate tongues are mounted in a novel manner and cooperate with novel apparatus to provide a positive return motion to the intermediate tongues for positively, accurately and quickly positioning the tongues in proper predetermined positions when

the gripper is in an open condition such that the intermediate tongues are readily insertable into the gaps of the column. Then, when the gripper is closed, the positive return force is



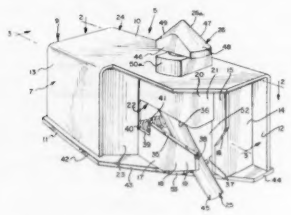
released thus permitting the intermediate tongues to float or move as required into gripping engagement with the adjacent bricks of the column thus providing the required intermediate support.

3,825,294

TWIST LOCK ARRANGEMENT FOR TYING CONTAINER DOWN

George W. Carr, Cincinnati, Ohio, assignor to Pullman Incorporated, Chicago, Ill.

Filed Jan. 21, 1972, Ser. No. 219,631
Int. Cl. B62d *25/00*
U.S. Cl. 296—35 A 8 Claims



A chassis-to-container locking arrangement which includes a housing defined by the lateral end extension of the chassis crossmember, the housing including a cam slot which has a front horizontal slotted portion and said slot having a side vertical slot portion connecting with the front slot portion which side slotted portion allows the handle to move a locking cone to a locked position, with a slightly outwardly sloping lower edge and an inner lower cutout section for entrapping the handle for holding the locking cone in an unlocked position and although the locking cone may be held in either the locked or unlocked position by gravity a biasing spring connected to the handle and the interior of the housing aids in seating the handle in a biased down location attendant to locking or unlocking of the locking cone. By this arrangement the locking cone is rotated 90° in going from its locked position to its unlocked position.

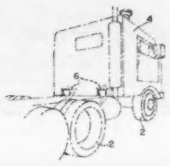
3,825,295

TRUCK CAB LATCH

James W. Saunders, Milpitas, and Donald L. Stephens, Los Gatos, both of Calif., assignors to Paccar Inc., Bellevue, Wash.

Filed Apr. 3, 1972, Ser. No. 240,537
Int. Cl. B62d *27/06*
U.S. Cl. 296—35 R 5 Claims

A latch mechanism for use upon a cab over engine truck which is adapted to be unlatched upon introduction of fluid under pressure to the cylinders which raise the cab and yet is designed to latch and remain secure under pulling, twisting or application of pressure different from the sequence predetermined to unlatch. The latch is adapted to withstand great pressure without damage to the structure. The hook of the



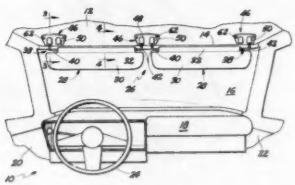
mechanism is spring biased towards the latched condition, during the unlatching operation the bias is overridden, and the mechanism permits reliable latching with a short operating stroke.

3,825,296

ANTI-GLARE SYSTEM FOR MOTOR VEHICLES

Stuart R. Peterson, 790 Southgate Office Plaza, 5001 W. 78th St., Minnetonka, Minn. 55437

Filed Apr. 24, 1972, Ser. No. 246,858
Int. Cl. B60j *3/02*
U.S. Cl. 296—97 D 39 Claims



A pair of glare shields have ball-shaped ends releasably engageable with several brackets attached at fixed locations adjacent the windshield of a motor vehicle. In one embodiment the brackets are formed with sockets and resilient members that releasably hold the ball-shaped ends. In a second embodiment the brackets are formed with sockets and magnetic members that releasably hold the ball-shaped ends. In both embodiments the driver or front seat passenger may elect to have both shields in a generally planar relation with the windshield, or a choice may be made as to whether either shield is in a planar relation with the windshield in front of the driver or in front of the passenger with the other shield angling rearwardly away from the windshield at the left of the driver, between the driver and passenger, or at the right of the passenger. In this way the two glare shields can be individually swung into a number of sun-obstructing positions, the user selecting an arrangement most effective for the particular light conditions then being encountered.

3,825,297

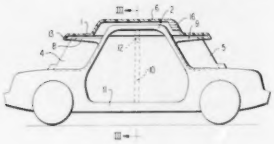
ARRANGEMENT OF A ROOF IN A MOTOR VEHICLE

Bela Barenyi, Maichingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

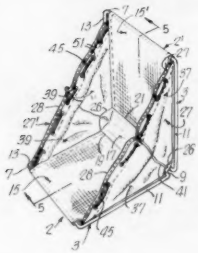
Filed Sept. 13, 1972, Ser. No. 288,798
Int. Cl. B62d *25/06*
U.S. Cl. 296—137 R 43 Claims

An arrangement of a roof of a motor vehicle, especially of a passenger motor vehicle, which includes two lateral roof girders extending approximately from a windshield pane to a rear window panel; the roof girders are disposed above the base

surface of the roof constructed as lifting or pivoting roof, which is provided within the area of the roof girders with raised portions projecting upwardly above its base surface and whose edges serve as boundary for door apertures.



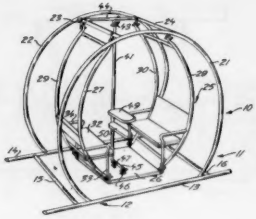
3,825,298
COMBINATION CARRY CASE AND SEAT
Julian C. C. Chipman, 1321 Sherbrooke St. W., Montreal, 109, Quebec, Canada
Filed May 22, 1972, Ser. No. 255,483
Int. Cl. A47c *13/00*
U.S. Cl. 297—129 **4 Claims**



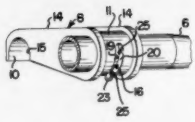
This invention relates to a combined carry case and seat. The carry case and seat comprises a pair of rectangular or square, tubular frames. Main fabric panels are provided on each frame extending between the top and bottom of the frame. A bottom fabric panel extends between the main fabric panels near the bottom of the frames to join the frames together. A pair of side fabric panels extend between opposite side edges of the main panels and are joined along a bottom edge to the ends of the bottom panel. A continuous drawstring is provided about the upper edges of the side panels and extending through the upper corners of the main panels. The frames can be placed at right angles to one another in one position so as to form a seat with the bottom panel loose. In a second position, the frames, together with the bottom panel, form a flat bottom carry case for carrying articles, by means of the drawstring. The side panels are pleated in the carry case position and extended in the seat position.

3,825,299
LAWN SWING
Romeo Oliva Gaucher, Bonneyville, Alberta, Canada
Filed July 13, 1972, Ser. No. 271,631
Int. Cl. A47b *39/00*
U.S. Cl. 297—157 **3 Claims**

A lawn swing having a level swing platform which is suspended for swinging movement in a supporting frame by hinged swing support members, hinged connections defining corners of a parallelogram so that the platform remains level when it swings; and a centrally located strut having a hinged connection with the frame and the platform for supporting a table centrally of the platform, the table swinging in and tangential to an arc having as its center the hinged connection of the strut with the supporting frame.



3,825,300
CHAIR AND GANGING STRUCTURE
Edgar M. Lieberman, and Bobbie L. Snyder, both of Kansas City, Mo., assignors to Fixtures Mfg. Corp., Kansas City, Mo.
Filed Feb. 20, 1973, Ser. No. 334,071
Int. Cl. A47c *15/00*
U.S. Cl. 297—248 **6 Claims**

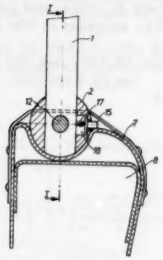


A chair having a back and seat structure mounted on a frame structure and having a pair of legs on each side of the chair depending therefrom for engagement with a supporting surface. Ganging clips are movably mounted on certain legs of the chair for engagement with legs of an adjacent similar chair to gang same in side-by-side relation. The ganging clips each have an open portion for receiving and retaining the leg of said adjacent chair. The ganging clips are movable from a ganging position to a retracted position and are suitably limited in movement to the selected positions.

3,825,301
HEAD AND NECK REST
Bernhard Schwarz, 11 Eichenstrassa, Muri, Bern, Switzerland
Continuation-in-part of Ser. No. 4,346, Jan. 20, 1970, Pat. No. 3,652,128. This application Jan. 10, 1972, Ser. No. 216,454
Claims priority, application Switzerland, Jan. 23, 1969, 1155/69; July 12, 1969, 10710/69; Aug. 29, 1969, 13298/69; Germany, Jan. 21, 1970, 2002566The portion of the term of this patent subsequent to Mar. 28, 1989, has been disclaimed.
Int. Cl. A47c *7/36*
U.S. Cl. 297—408 **8 Claims**

A head and neck rest for vehicle seats comprises a head piece secured to a supporting rod which is mounted by the intermediary of an articulated joint on a saddle member on the back rest of a seat. The joint allows a backwards tilting movement of the supporting rod to which is secured the head piece. Movable and stationary axially aligned joint members are axially traversed by a clamping rod for exerting a predetermined clamping force on the movable member of the joint by the sta-

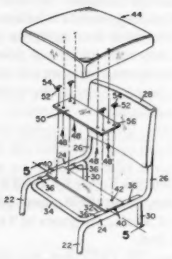
tionary members and causing the movable joint member carrying the head piece to resist a tilting movement due to the action of a shock received by the head or neck of a passenger using the seat of a vehicle.



3,825,302
SEAT FASTENING MEANS

Leo Kurtz, 230 174th St. No. 1208, Cincinnati, Ohio 33160

Filed Dec. 14, 1972, Ser. No. 315,169
Int. Cl. A47c *7/00, 7/14*
U.S. Cl. 297—452 **16 Claims**



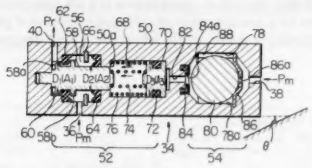
A chair frame has a pair of spaced substantially horizontal side members for support of a seat, and said side members are spanned by a fixed panel upon which a chair seat may be superposed and anchored with great ease and despatch and without the use of tools or mechanical ability. The seat carries fastening means to engage the fixed panel either permanently or releasably, whereby the chair is fully prepared for use.

3,825,303
FLUID PRESSURE REGULATING DEVICE FOR AUTOMOTIVE BRAKING SYSTEMS

Keiichiro Yabuta, Yokohama, Japan, assignor to Nissan Motor Company Limited, Yokohame City, Japan

Filed Sept. 22, 1972, Ser. No. 291,384
Claims priority, application Japan, Sept. 23, 1971, 46-74278; Sept. 23, 1971, 46-74279; Nov. 12, 1971, 46-90455
Int. Cl. B60t *13/06*
U.S. Cl. 303—6 C **13 Claims**

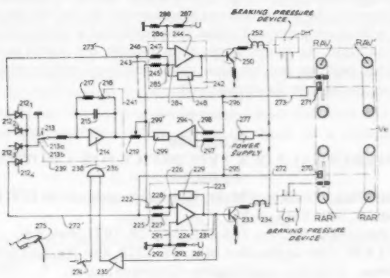
An improved fluid pressure regulating device which is incorporated in a motor vehicle braking system having a master cylinder and a wheel cylinder or cylinders. The pressure regulating device includes a pressure proportioning or limiting valve section using a combination of a fluid operated plunger and a fluid operated and spring loaded piston, an inertia-responsive valve section including a valve member usually in the form of a ball which is responsive to a predetermined rate of deceleration so as to vary the fluid pressure acting on the piston, and control means for controlling the axial movement and accordingly the output pressure from the pressure proportioning or limiting valve section to the wheel cylinder or cylinders. Various preferred constructions of the control means are disclosed.



3,825,304
METHOD OF ELECTRICALLY CONTROLLING BRAKING OF A VEHICLE AND AN ELECTRONICALLY CONTROLLED BRAKING DEVICE FOR A VEHICLE

Edmond Kiatipoff, Paris, France, assignor to Andre Sauget, Saint-Cyr and Michel Fremand, Saint-Oven, both of, France

Filed May 24, 1972, Ser. No. 256,541
Claims priority, application France, May 27, 1971, 71.19285; Apr. 28, 1972, 72.15346
Int. Cl. B60t *8/08*
U.S. Cl. 303—21 BE **18 Claims**



The present invention relates to an electronic braking method and installation for wheeled vehicles.

The installation comprises sensors for determining the speeds of the wheels, apparatus for memorizing the speed of the vehicle and apparatus for braking the rear wheel or wheels in such a way as to bring it (them), during a braking phase, to a speed equal to a first fraction of the memorized speed of the vehicle until the speed of the vehicle is equal to that of the rear wheel or wheels, apparatus for braking the front wheel or wheels, during said braking phase and concurrently with the braking of the rear wheel or wheels, in such a way as to bring it (them) to a speed equal to a second fraction, smaller than the first fraction, of the memorized speed of the vehicle, and apparatus for operating the memorization apparatus at the end of said braking phase to start new braking phases.

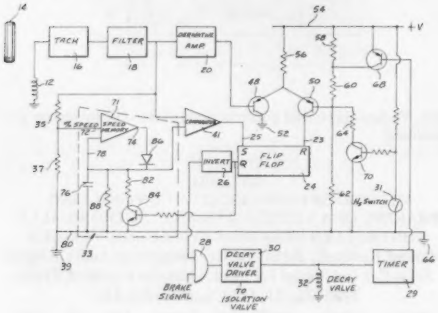
3,825,305
ADAPTIVE BRAKING SYSTEM

John T. Kasselmann, Southfield; George B. Hickner, South Bend; Donald W. Howard, South Bend, and James M. Needham, South Bend, all of Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed June 16, 1972, Ser. No. 263,520
Int. Cl. B60t *8/12*
U.S. Cl. 303—21 BE **6 Claims**

An adaptive braking system for an automotive vehicle is disclosed which includes a speed reacquisition feature which

precludes termination of a brake pressure decay cycle until the controlled wheel attains a predetermined percentage of the angular velocity at which the wheel was rotating at the time that the decay cycle was initiated. The adaptive braking system includes the usual comparator which compares wheel acceleration to a predetermined reference level and generates a signal initiating a decay cycle when the wheel decelerates in



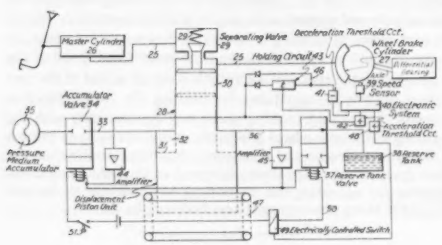
excess of the reference level. The output signal of the comparator also enables a speed memory circuit which memorizes a predetermined percentage of the wheel speed. A comparator compares the instantaneous wheel speed during the decay cycle with the memorized value, and generates a signal which may maintain the decay cycle even though the wheel reaccelerates past an acceleration reference level which would normally terminate the decay cycle.

3,825,306

DIFFERENTIAL-LOCK TYPE DEVICE FOR A MOTOR VEHICLE

Werner Fink, Frankfurt/Main, Germany, assignor to ITT Industries, New York, N.Y.

Division of Ser. No. 166,849, July 28, 1971, Pat. No. 3,771,839. This application Mar. 19, 1973, Ser. No. 342,655
Claims priority, application Germany, Oct. 7, 1970, 2049262
Int. Cl. B60t 8/12
U.S. Cl. 303—21 BE **9 Claims**



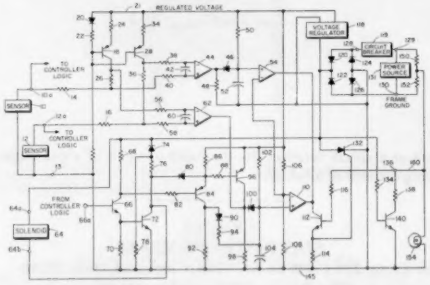
There are disclosed arrangements combined with known anti-skid systems that will prevent spinning of one drive wheel while the other drive wheel is stationary due to differential gearing. This is accomplished by providing a threshold circuit responsive to excess acceleration of the spinning wheel, in addition to the normal acceleration threshold circuits of an anti-skid system, to cause brake pressure to be applied to the wheel brake cylinder of the spinning wheel. The additional threshold circuit is placed in operation by the vehicle driver.

3,825,307

MEANS FOR DETECTING FAILURE OF VARIOUS ELEMENTS OF AN ADAPTIVE BRAKING SYSTEM THROUGH THE USE OF TRICKLE CURRENTS

Ralph W. Carr; Ward A. Ingels, and Leoncio T. Ang, all of Newport News, Va., assignors to The Bendix Corporation, Southfield, Mich.

Filed Apr. 13, 1973, Ser. No. 351,064
Int. Cl. B60t 8/00
U.S. Cl. 303—21 AF **6 Claims**



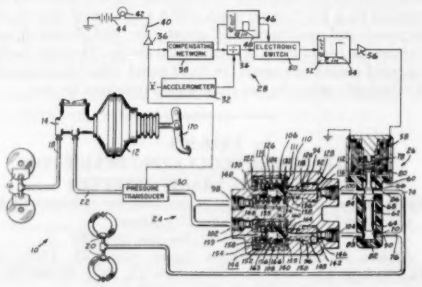
A circuit useful in adaptive braking systems for detecting sensor and load failures provides an operator warning and prevents automatic braking should a failure occur. Cross coupled comparators consider d.c. currents through the wheel speed sensors and interrupt electrical power to the braking system if a sensor is opened or shorted. A threshold circuit considers a trickle current through the brake pressure modulator to detect failures therein.

3,825,308

PROPORTIONING VALVE CONTROL MEANS

John T. Kasselmann, Southfield, and Michael B. Goran, Bloomfield, both of Mich., assignors to The Bendix Corporation, Sound Bend, Ind.

Filed Apr. 30, 1973, Ser. No. 355,615
Int. Cl. B60t 8/26
U.S. Cl. 303—21 A **11 Claims**



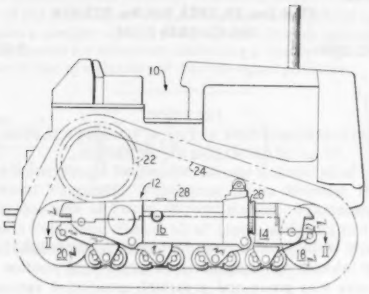
A system of selectively controlling a plurality of proportioning valves through means of a computer control signal. The control signal is derived by dividing a first signal representative of the available fluid pressure output from a master cylinder by a second signal representative of the rate of change in speed of a vehicle. A plunger valve responsive to the control signal is moved to allow fluid to flow in a selected flow path. The fluid will activate the rear wheel brakes with a force proportional to the front wheel brakes to provide optimum braking during deceleration.

3,825,309

TRACK FRAME RECIPROCATING MECHANISM FOR TRACK-TYPE TRACTORS

Ronald L. Krolak, Metamora, and Eldon D. Oestmann, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 22, 1972, Ser. No. 282,698
Int. Cl. B62d 55/30
U.S. Cl. 305—31 3 Claims



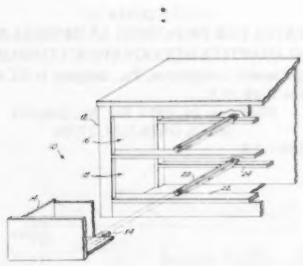
A vehicle has on either side thereof a drive sprocket and front and rear ground idlers, and a track trained over and engaged by the drive sprocket and idlers. A frame is associated with the vehicle and has a forward portion on which the front idler is mounted, and a separate rearward portion on which the rear idler is mounted. The front and rear frame portions are associated by means of a pair of tubes extending from each, one inside the other, in sliding relation. Splined means are associated with the tubes to keep the front and rear idlers aligned relative to each other, and resilient means are associated with the tubes to allow recoil of the front idlers, meanwhile urging the front idler forwardly into a biased condition.

3,825,310

INTERNALLY REINFORCED DRAWER GUIDE

Bruce W. Roemer, Portland, Oreg., assignor to Barker Manufacturing Company, Portland, Oreg.

Filed Mar. 1, 1973, Ser. No. 337,072
Int. Cl. F16c 21/00
U.S. Cl. 308—3.6 4 Claims



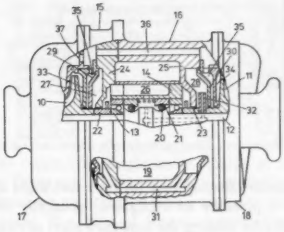
An internally reinforced, molded plastic drawer guide for chests using center-guide construction. A guide having balanced strength and stiffness is produced by distributing glass fibers substantially uniformaly throughout the body of the guide, including regions spanning the joinder of the body's component parts.

3,825,311

HIGH SPEED ROTATING MACHINES

Brian Desmond Allan Murray, Somerset, England, assignor to Normalair-Garrett (Holdings) Limited, Somerset, England

Filed Jan. 17, 1973, Ser. No. 324,515
Int. Cl. F16c 33/74
U.S. Cl. 308—36.3 7 Claims



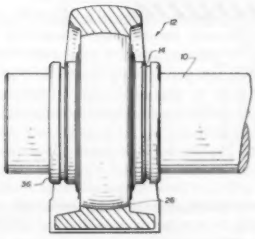
Bearing seal means for high speed rotating machines which have a rotatable assembly supported by bearings and enclosed lubricating means therefor. The seal means provides ducts directing pressurised air towards the rotating shaft assembly outboard of both ends of the enclosure. The pressurised air bleeds from the ducts adjacent to the shaft assembly to pressurise a region between the seal means and the outboard faces of the enclosure to prevent oil seepage from the enclosure. Air bleed from the ducts is also permitted in an outboard direction and can provide cooling across the back of a compressor wheel.

3,825,312

SHAFT LOCK DEVICE

Charles M. Allaben, Jr., Ithaca, N.Y., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Feb. 9, 1973, Ser. No. 331,137
Int. Cl. F16c 33/30
U.S. Cl. 308—236 4 Claims

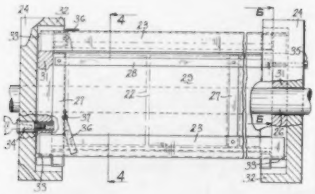


A relatively compact arrangement for locking power transmission parts, such as bearings, pulleys, gears, sprockets and the like to shafts which comprises a cylindrical portion of the part having an inside truncated conical surface surrounding the shaft and a sleeve having an exterior surface complementary to the inside conical surface of the part and a bore for the shaft whereby a wedging action caused by axially moving the sleeve relative to the part, the part is locked to the shaft.

3,825,313
THEFT-RESISTANT DISPLAY CASE FOR TAPE CARTRIDGES OR THE LIKE

Albert R. Cuozzo, 77 First Ave., West Haven, Conn. 06516

Filed May 24, 1973, Ser. No. 363,479
Int. Cl. A47f 3/10
U.S. Cl. 312—135 8 Claims

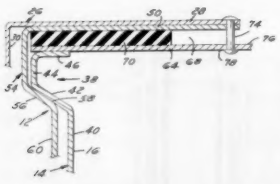


A theft-resistant display case for tape cartridges or the like, comprising: a plurality of elongated, generally rectangular cage-like racks for holding the tape cartridges or cassettes side by side, the cages being formed of metal straps or of plastic with apertures therethrough for viewing indicia on the cartridges. The racks are arranged together in column form with removable rails running between the longitudinal edges of the racks to prevent removal of cartridges transversely out of the racks. The racks have portions arranged to overlap the faces of the cartridges above and below the indicia so as to prevent lifting of the cartridges out of the racks. End caps fit over the ends of the racks and the rails, and are lockable thereon. The display case is rotatable about its longitudinal axis for viewing of the cartridge indicia, while affixed to a suitable surface to prevent removal.

3,825,314
ASH RECEPTACLE FOR AUTOMOBILES

Jack W. Blake, Grand Rapids, Mich., assignor to F. L. Jacobs Co., Southfield, Mich.

Continuation of Ser. No. 220,236, Jan. 24, 1972, abandoned.
This application June 26, 1973, Ser. No. 373,733
Int. Cl. B60n 3/08, 3/10, 3/12
U.S. Cl. 312—246 15 Claims

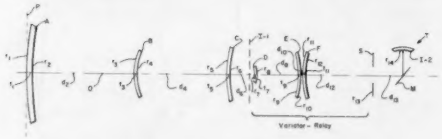


The ash tray is of the drawer type conventionally utilized in vehicles. A housing or retainer is provided for attachment to the dashboard or other suitable support structure within the vehicle. The drawer, which is for the reception of ashes, is slidably received within the housing for withdrawal as the need arises. The housing includes a center panel with depending flanges on opposite sides thereof, with tracks provided on the flanges. A pressure plate extends across the housing beneath the center panel and is spaced therefrom. Resilient means made from a yieldable material such as rubber or from a plastic material is interposed in the space between the center panel and the pressure plate. Fastening means yieldably connect the pressure plate to the center panel of the retainer. With such a construction the end portions of the pressure plate engage rails provided on the drawer and yieldably urges the rails of the drawer against the tracks provided on the housing.

3,825,315
ZOOM LENS OPTICAL SYSTEM FOR INFRARED WAVELENGTHS

Richard M. Altman, 22216 Victory Blvd., and Jerome J. Rosenblatt, 20334 Alerion Pl., both of Woodland Hills, Calif. 91364

Filed Jan. 29, 1973, Ser. No. 327,516
Int. Cl. G02b 15/14
U.S. Cl. 350—2 9 Claims

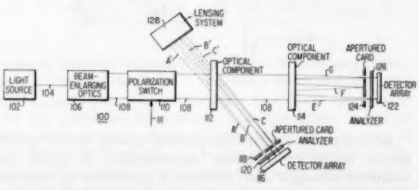


There is disclosed a zoom lens optical system suitable for use at infrared wavelengths comprising a fixed position front objective lens group and a variably positioned variator or zoom lens group both positioned along an optic axis and related in such a fashion that the variator lens means serves to relay a fixed position intermediate image formed by the objective lens means to the image surface or focal plane of the system which image is also fixed in position on the optic axis within design tolerance limits. The movement of the variator produces a continuous zoom effect in that the focal length of the system is different for each different position of the variator lens. Such a zoom lens is particularly adapted for, but not restricted in use to, optical systems for forming an image at infrared wavelengths. Such infrared systems include a detector array positioned at the second image or focal surface with a scanning device such as a mirror and an aperture stop between this array and the variator lens. The detector array must be multiplexed due to the scanning technique which in turn must be such as to accommodate the response time of the infrared detector. The resulting problem of aperture scanning or loss of part of the image forming beam by vignetting or the like which occurs in such infrared systems is overcome by designing the foregoing lens arrangement to position the entrance pupil of the system at the front surface of the objective lens for any position of the variator lens as a starting design point. Specific lens constructional parameters are given for two exemplary embodiments.

3,825,316
APPARATUS FOR PROVIDING AN OPTICAL SYSTEM USING ADAPTIVE HOLOGRAPHIC COMPONENTS

Juan Jose Amodei, Langhorne, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 24, 1972, Ser. No. 246,653
Int. Cl. G02b 5/18, 27/00
U.S. Cl. 350—3.5 2 Claims



A laser produces a beam of polarized coherent light which is transmitted through a polarization switching device that ad-

justs the orientation of the plane of polarization of the transmitted light in either one of two mutually orthogonal states in response to an input signal. The light transmitted by the polarization switching device then impinges on a transparent electro-optic crystal material whose index of refraction along its C-axis varies in accordance with the interference fringes of a preestablished holographic pattern. In one embodiment, the optical system includes an electro-optic beam deflector to provide a strongly polarization dependent digital laser beam deflection system, whereby the beam will be deflected in a different predetermined direction depending on the polarization state of the beam. In another embodiment, the optical system includes a complex optical component to provide light deflection apparatus for selectively deflecting a beam of light from a source to one of a plurality of discrete target positions.

3,825,317

APPLICATION OF A NOVEL PHOTOSENSITIVE MEMBER TO HOLOGRAM

Eiichi Inoue; Junpei Tsujiunchi; Hiroshi Kokado, all of Tokyo, Takashi Yamaguchi, Yokohama; Isamu Shimizu; Hiraku Sakuma, both of Tokyo; Hiroshi Hanada, Yokohama, and Yukio Tokunaga, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed July 27, 1972, Ser. No. 275,736

Int. Cl. G03c *5/04*

U.S. Cl. 350—3.5 **17 Claims**

A hologram comprises an interference pattern composed of a mutual diffusion portion of a photoconductor and a metal formed at an exposed portion of a photosensitive member, the photosensitive member containing two constituting elements, that is, a photosensitive receptor containing a photoconductor and a photosensitive intensifier capable of diffusing into the photoconductor when irradiated and at least one of the constituting elements being in a layer form, and the combination of the constituting elements being selected from the group consisting of (i) each of the two constituting elements being in a form of layer, (ii) one constituting element being in a form of layer and the other constituting element being dispersed in said layer, and (iii) one constituting element being in a form of layer and the other constituting element being contacted with the surface of said layer.

3,825,318

WAVEGUIDE COUPLER HAVING TRANSPARENT STRATIFIED STRUCTURE WITH PARALLEL FACES

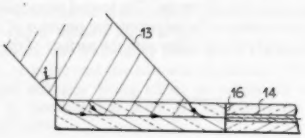
Michel Croset, and Gonzalo Velasco, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Aug. 10, 1972, Ser. No. 279,361

Claims priority, application France, Sept. 16, 1971, 71.33389

Int. Cl. G02b *5/14*

U.S. Cl. 350—96 WG **5 Claims**



An optical structure with parallel faces, has a refractive index decreasing continuously from one face to the other.

The structure is produced by reactive cathode sputtering of tantalum in the presence of oxygen. It makes it possible, by refraction, to render parallel light rays which enter at varying angles of incidence.

3,825,319

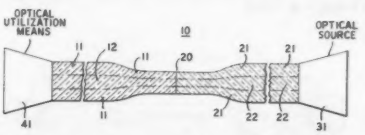
BUTT-JOINED OPTICAL FIBERS

John Stone Cook, Summit, and Enrique Alfredo Jose Marcatili, Rumson, both of N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.Y.

Filed Feb. 26, 1973, Ser. No. 335,667

Int. Cl. G02b *5/14*

U.S. Cl. 350—96 WG **3 Claims**



In order to minimize electromagnetic radiation losses in optical fibers (especially single-mode fibers) at the locations where the fibers are joined together as by butt-joining, such optical fibers are constructed with a reduced diameter at the joint locations. The reduced dimaeters of the fibers at the locations of joining ("joints") cause an increase in the diameter of the cross section of electromagnetic field at these locations. Thereby, electromagnetic radiation losses due to lateral misalignments at joint locations in optical fibers are reduced.

3,825,320

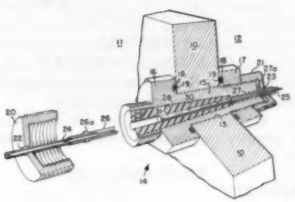
HIGH-PRESSURE OPTICAL BULKHEAD PENETRATOR

John T. Redfern, La Jolla, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 2, 1973, Ser. No. 337,492

Int. Cl. G02b *5/16*

U.S. Cl. 350—96 B **9 Claims**



A fitting including a bushing extending through a high-pressure hull provides a multichannel data capability while possessing resistance to an extreme pressure differential. A cylindrical or tapered plug of glass having a graded refractive index or a cylindrical or tapered bundle of fiber optics is bonded within an accommodatingly shaped bore coaxially disposed in the bushing. Having such a configuration and manner of construction allows the fitting to be of reduced size with respect to contemporary electrical hull-penetrators, yet a much greater data transfer capability is provided and this fitting will stand up under the crushing pressures encountered at extreme ocean depths.

3,825,321

WIDE ANGLE LENS SYSTEM

Yasuo Takahashi, Tokyo, Japan, assignor to Asohi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Mar. 26, 1973, Ser. No. 345,145

Claims priority, application Japan, Mar. 28, 1972, 47-30975

Int. Cl. G02b *9/62*

U.S. Cl. 350—215 **1 Claim**

A wide angle lens system includes 10 lenses in which the third, fourth and fifth lenses and the sixth, seventh and eighth

lenses are cemented to form respective first and second triplet substems, the system satisfying the following conditions:

$F/0.9 < F_1 < F/0.6, F_1 < 0$

$F/0.95 < F_{1.2} < F/0.57, F_{1.2} < 0$

$5F < F_2$

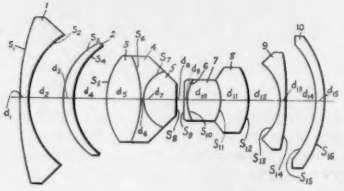
$F/2.3 < F_{1.2 \ldots 8} < F/1.65$

$F/1.3 < F_{1.2 \ldots 9} < F/1.05$

$0.25F < r_{13} < 0.37F, r_{13} < 0$

$0.5F < r_{15} < 0.6F, r_{15} < 0$

$0.1 < n_4 - n_5 < 0.2$



$0.12F < r_7 < 0.2F$

$\nu_6 - \nu_7 < 0.6$

$0.05 < n_6 - n_7 < 0.15$

$0.18 < r_{11} < 0.26F, r_{11} < 0$

Wherein F is the focal length of the entire system, $F_{1.2 \ldots 1}$ is the focal length of the subsystem including the first to the i th lens, F_i is the focal length of the i th lens, N_i is the d-line refractive index of the i th lens, ν_i is the Abbe's number of the i th lens, and r_j is the radius of curvature of the j th lens surface, cemented confronting lens faces defining a single surface.

3,825,322

ILLUMINATION SYSTEM

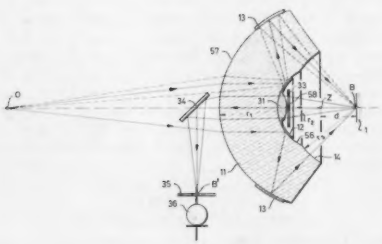
Fred Mast, Wil, Saint Gall, Switzerland, assignor to Gretag Aktiengeselischaft, Regensdorf, Switzerland

Filed Dec. 29, 1972, Ser. No. 319,169

Claims priority, application Switzerland, Dec. 31, 1971, 19246/71

Int. Cl. G02b *27/02*

U.S. Cl. 350—236 **7 Claims**



An optical system is provided which in conjunction with a light source is used to illuminate an object whose reflective properties are required to be measured. The optical system comprises a condenser lens having first and second spherical surfaces, the first having an annular reflective surface on its periphery and the second an annular reflective surface at its central portion. A positive lens is mounted in the aperture of the reflective annular surface on the second surface of the condenser lens which has a third spherical surface surrounding the second surface. The center of curvature of the third surface defines the position of the object which is illuminated by light entering the first surface, being reflected from the reflective surface on the second surface back through the condenser, reflected from the reflective surface on the first surface back through the condenser lens to exit from the third surface to be focussed on the object. Light reflected by the object is focussed by the positive lens through the condenser on to a light measuring system.

3,825,323

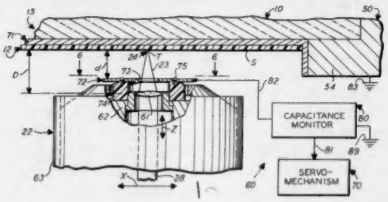
ROTARY DISC RECORDING AND READOUT SYSTEM HAVING CAPACITANCE CONTROLLED LENS POSITIONING MEANS

Donald C. Landwer, Arlington Heights, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed May 17, 1973, Ser. No. 361,376

Int. Cl. G02b *7/02*; **G01d** *15/14*

U.S. Cl. 350—255 **4 Claims**



The focal plane of a focused energy beam is adjusted to match the instantaneous position of the surface of a nonconductive film being treated by the beam. For example, the position of a focused laser beam used to record and read-out data in the surface of a moving thermoplastic film is adjusted to accommodate vagaries in the location of successive spots along the surface of the film. The film is formed on the surface of a record, which is mounted on a turntable during recording and readout. The positioning is done by backing the film with a conductive surface of the record; mounting an electrode to the lens used to focus the beam, in closely spaced relationship to the film; and sensing the capacitance between the conductive surface and the electrode. The sensed capacitance is used to drive a servomotor for adjusting the position of the lens so that the focal plane coincides with the surface of the film.

3,825,324

REMOTELY CONTROLLED MIRROR AND POWER AMPLIFIED DRIVE MEANS THEREFOR

Harold G. Brewington, P.O. Box 176, Widener, Ark. 72394

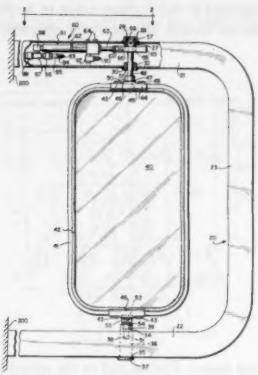
Filed June 13, 1972, Ser. No. 262,201

Int. Cl. G02b *5/08*

U.S. Cl. 350—289 **5 Claims**

An apparatus for remotely controlling, from the inside of a vehicle, the position of a side-view mirror mounted on the outside of the vehicle. The apparatus includes a support for

rotatably mounting a mirror to a vehicle, an electrical, hydraulic, or pneumatic power amplified driving mechanism for

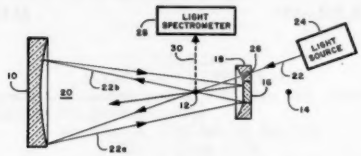


rotating the mirror to the desired position, and associated control devices for controlling the driving devices.

3,825,325
LIGHT TRAP

Danny L. Hartley, Livermore, Calif., and Ronald A. Hill, Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Feb. 14, 1973, Ser. No. 332,541
Int. Cl. G02b *5/10*
U.S. Cl. 350—294 **5 Claims**



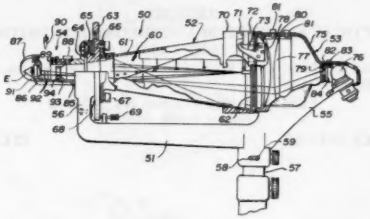
A light trap into which a beam of light is directed and caused to be reflected many times through a focal point over a different path on each reflection to achieve an increase in light energy density at the focal point from a given light energy beam. Very large gains may be achieved utilizing a concave ellipsoidal light reflector which reflects light directed from a primary focal point toward a secondary focal point along a common axis and a second light reflector which reflects light directed toward the secondary focal point back toward the primary focal point and the concave ellipsoidal reflector, the second light reflector being either an ellipsoidal or planar reflector, in combination with an appropriately oriented spherical reflector.

3,825,326
INSTRUMENT FOR IMPROVED EYESIGHT-REFRACTION TESTING

Eastman Smith, Mountain Home, Ark. 72653

Filed May 18, 1972, Ser. No. 254,757
Int. Cl. A61b *3/02*
U.S. Cl. 351—32 **5 Claims**

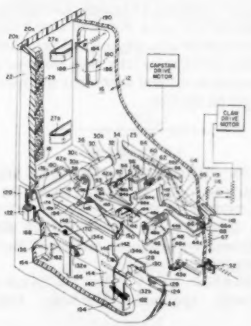
An instrument for eyesight-refraction testing, herein designated generically as an "Xactometer," employing optical targets with clearly recognizable details when focused which are positioned singly or repeated, or partially repeated at transverse or lateral intervals of angles, and also at the same time are repeated or partially repeated at longitudinal, or sight-axial, intervals of distances relative to the examined eye. The target elements preferably are of increasing or descreasing lateral size directly proportioned to the distances, with the effect that all similar target elements at whenever distances subtend closely, or exactly the same visual angles and thus appear to the eye as of the same size and appear assembled adjacently in the same lateral plane. Such transverse angular positions are either optionally fixed or manually rotatable, and such longitudinal distances are similarly either fixed or shiftable optically by eye-lens add-power or other lens power focusable, for the purpose of locating positions and distances of best recognition or optimum resolution in retinal imaging. The recognizable distances indicate the desired corrective lens sphere-power and cylinder power; while the transverse angles indicate the desired corrective lens cylindrical-axis.



3,825,327
SOUND MOTION PICTURE CAMERA

Gerald Julius Kosarko, Pavillion; Ronald Charles Holzhauser, Holley, and Edgar Samuel Marvin, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 20, 1973, Ser. No. 333,588
Int. Cl. G03b *23/02*
U.S. Cl. 352—29 **23 Claims**



A sound motion picture camera is adapted to receive a sound film cartridge to record both images and sound onto a film strip carried by the cartridge. The camera includes a sound transducer for recording sound, a pressure member for cooperating with the film to support the film closely adjacent to the sound transducer, guide means for guiding the film strip past the transducer, a capstan drive and a cooperating pressure roller for advancing the film strip as a sound sequence is being recorded, a cartridge ejecting member for at least par-

tially removing a film cartridge from the cartridge chamber of the camera, and a latching member for securing a door to the cartridge chamber. In the camera, the pressure member, the guide means, the pressure roller, the cartridge ejecting member and the latching member are selectively movable by a conditioning mechanism for permitting the cartridge and film strip to be readily inserted into the camera to permit recording of images and sound onto the film strip, or for ejecting the cartridge and the film strip from the cartridge chamber of the camera.

3,825,328

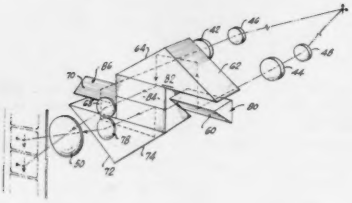
OPTICAL SYSTEM FOR A STEREOSCOPIC MOTION PICTURE CAMERA

Winton C. Hoch, 1491 Stone Canyon Rd., Los Angeles, Calif. 90024

Filed Sept. 10, 1973, Ser. No. 396,110

Int. Cl. G03b *35/02*

U.S. Cl. 352—60 **32 Claims**



An optical system for making stereoscopic motion pictures which may be attached to a conventional motion picture camera of the type including a supply of film and a film drive mechanism for advancing the film past a picture aperture. The optical system makes it possible to produce simultaneously stereo pairs of adjacent, vertically spaced left and right images of the field of view one above the other on the film. The system includes laterally spaced left and right objective lenses forming left and right images of the field of view. Corresponding, image erecting systems provide folded optical paths to a single inverting relay lens which directs the focused, vertically aligned and spaced, left and right images on the film within the desired film area. The left and right image erecting systems cause an opposite reversal of image orientation to the image reversal caused by the relay lens and also bring the left and right images into vertically aligned and separated relation on the incident side of the relay lens, thus ensuring correct image orientation as well as vertical alignment and spacing of the left and right images on the film.

3,825,329

MOTION PICTURE CAMERA HAVING MEANS FOR SIMULTANEOUSLY SELECTING THE FILM SPEED AND THE CORRESPONDING APERTURE SIZE

Frank-Armin Heinrich, and Hans-Friedrich Kiefer, both of Stuttgart, Germany, assignors to Robert Bosch Photokino GmbH, Stuttgart, Germany

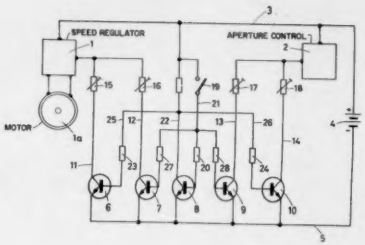
Filed Mar. 19, 1973, Ser. No. 342,812

Claims priority, application Germany, Mar. 22, 1972, 2213837

Int. Cl. G03b *7/08*

U.S. Cl. 352—141 **4 Claims**

A motion picture camera is adapted to operate at a first and second film speed and requires a first and second aperture size at the first and second film speed, respectively. A speed regulator regulates the speed of the camera to the first and second speed, respectively, when connected to the battery through a first and second resistor, respectively. Aperture control means open the aperture to the aperture size corresponding to the first film speed when connected to the battery through a third resistor and open the aperture to the second aperture size corresponding to the second film speed when connected to the source of electrical energy through a fourth resistor. First, second, third and fourth transistors connect the corresponding respective resistors to the battery when in a conductive state. A speed selector switch is externally operable to select the first or second speed. Connected to the speed selector switch is a control transistor which is interconnected with the bases of the first, second, third and fourth transistors in such a way that the first and third resistor is connected to the battery when the speed selector switch is in the first position and that the second and fourth transistors are conductive when the speed selector switch is in the second position.



3,825,330

MOTION PICTURE PROJECTOR DEVICE LOADED WITH A FILM CARTRIDGE

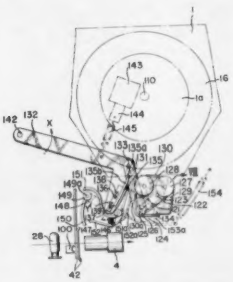
Kuniyoshi Suzaki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1973, Ser. No. 334,898

Claims priority, application Japan, Feb. 22, 1972, 47-18347; Feb. 24, 1972, 47-19269

Int. Cl. G03b *1/56*

U.S. Cl. 352—157 **24 Claims**



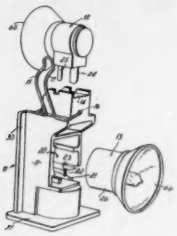
This specification discloses a motion picture projector loaded with a film cartridge supporting a film roll therein. The projector includes a stripper provided to make a resilient contact with said roll to strip a leader end portion off said film roll. The stripper has a strip passage surface for directing the stripped leader end portion from said film roll in a threading manner. A threading belt driven by three rollers is provided to make a pressure contact with said film roll to rotate the same in an unwinding direction. Two levers are provided to carry thereon said stripper and said threading rollers and belt, respectively. A connecting roller is further provided to transmit a drive to said threading rollers. The three levers together provide a linkage, which can be shifted to its operative position by actuating any one of the three levers.

3,825,331

PROJECTION LAMP CARRIER

Alex J. Procop, and Ace Boultinghouse, both of Northridge, Calif., assignors to Target Systems Corporation, Chatsworth, Calif.

Filed July 19, 1973, Ser. No. 380,879
Int. Cl. G03b 21/00
U.S. Cl. 352—198 8 Claims



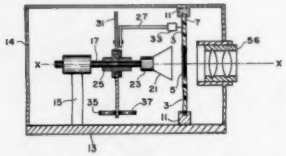
A removable projection lamp carrier operably positions a primary projection lamp as a source of light for a projector's projection path and stores a spare lamp in a compact inoperable position. The carrier is provided with an electrical socket for mounting the primary lamp, and with releasable connectors for providing current to the socket and the primary lamp from cooperating connectors in the projector when the carrier is in its operable position. The carrier has a non-electric socket for receiving a spare projection lamp in an inoperable position as a spare or replacement for the primary lamp. All electrical connections to the carrier are broken when it is removed from the projector for lamp replacement.

3,825,332

AUDIOVISUAL APPARATUS

Panayotis C. Dimitracopoulos, P.O. Box 458, Outremont, Montreal 154, Quebec, Canada

Filed Nov. 6, 1972, Ser. No. 304,203
Int. Cl. G03b 31/06
U.S. Cl. 353—19 5 Claims



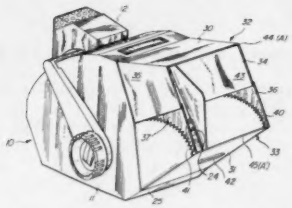
Audiovisual apparatus for use with an information tablet having an image record surrounded by a spiral information track, the audiovisual apparatus including a support member supporting the source, or the guiding elements, of a radiation beam directed onto the image to retrieve the imaging information contained therein, and a rotating transducer bearingly supported about this support member, the transducer employed to scan the information track.

3,825,333

SHROUD STRUCTURE FOR A MICROFILM READER

George J. Dali, Rochester, and William E. White, Hilton, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 7, 1972, Ser. No. 223,941
Int. Cl. G03b 21/10; G03b 21/30, 21/58
U.S. Cl. 353—75 1 Claim



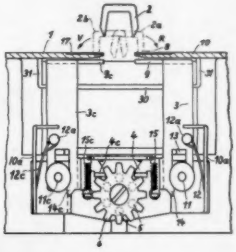
A shroud structure for a microfilm reader comprises two movable members, each of which is pivotally mounted on the reader housing adjacent a respective opposite edge of the viewing opening. Each member is interconnected to the other so as to be movable as a unit between a first and second position. In the first position, the shroud members cover the viewing opening and in a second position they form an extension and provide a shroud opening that is of maximal size. Since the two members are interconnected and movable as a unit, the extension of the members provides an opening that increases to a maximum size in the second position. Any number of intermediate positions are possible depending on the amount or the distance the shroud members have been extended. Hence, in any position of the shroud members, the amount of ambient light incident on the screen can be controlled.

3,825,334

FEEDING MECHANISM FOR SLIDE MAGAZINES OF PICTURE PROJECTORS

Reinhard Sobotta, Mascherode, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Filed Aug. 8, 1972, Ser. No. 278,765
Claims priority, application Germany, Aug. 13, 1971, 2140600
Int. Cl. G03b 23/04, 23/06
U.S. Cl. 353—103 7 Claims



Mechanism for feeding picture slide magazines of a photographic projector. The projector is provided with a guideway or track along which a bar-type slide magazine moves approximately horizontally parallel to the optical axis, and the projector has a claw mechanism for engaging a rack along the side of the bar-type magazine, to move it step by step so that one pic-

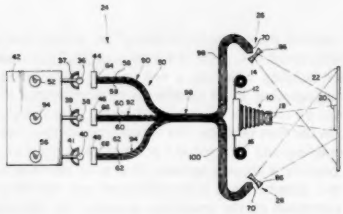
ture slide after another is brought into position to be shifted laterally from the magazine into alignment with the optical axis of the projector, for projection purposes. The present invention provides a housing for holding a slide magazine of circular or ring form, adapted to be placed in the same track in which a bar-type magazine may be mounted. A pinion for engaging a rack on the circular magazine is carried by the housing and is operated, through a slide, from the same feeding claw which is adapted to feed a magazine of the bar-type, when such a magazine is used.

3,825,335

VARIABLE COLOR PHOTOGRAPHIC LIGHTING SYSTEM

Robert Reynolds, Yuma, Ariz., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 4, 1973, Ser. No. 320,950
Int. Cl. G03b *27/76*
U.S. Cl. 355—1 **25 Claims**



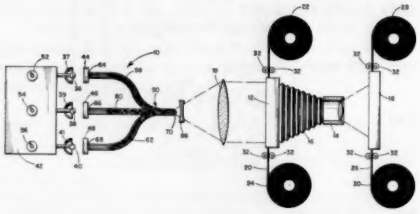
A variable color lighting system for illuminating a scene to be photographed. The system features one or more fiber optic light mixing devices which receive light from a plurality of different colored light sources and additively mix the light to form light of a composite color. By varying the intensity of the different colors of light, the color of the composite light output may be varied such that it is compatible with particular photosensitive materials being used in the photographic process.

3,825,336

VARIABLE COLOR PHOTOGRAPHIC LIGHTING SOURCE

Robert Reynolds, Yuma, Ariz., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 4, 1973, Ser. No. 320,951
Int. Cl. G03b *27/76*
U.S. Cl. 355—1 **29 Claims**



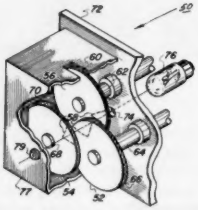
A variable color light source which is especially well suited for use in a photographic printer or enlarger for balancing the color of the light source such that it is compatable with particular photosensitive materials. The variable color light source features a fiber optic light mixing device for receiving different colored light, e.g., red, green and blue light, and combining the different colored light to form light of a composite color. By varying the intensity of the different colors of light, the composite color may be changed.

3,825,337

COLOR BALANCE DISPLAY

Frank L. Lucas, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 11, 1973, Ser. No. 322,655
Int. Cl. G03g *15/22*
U.S. Cl. 355—4 **4 Claims**



An apparatus in which the color relationship of a developability control system is displayed for indicating the balance thereof. The display apparatus is utilized in a multi-color electrophotographic printing machine and produces a visual indication of the color balance of copies being reproduced therein. A colored light ray is visible to the operator and functions as an indication of the color balance in the printing machine. When the colors of the copy are in balance, the operator will see a gray-black light. Adjustments are provided to vary the color balance; these adjustments, in turn, regulate the color of the light ray transmitted to the operator, thereby permitting the operator to visually note when the printing machine is producing copies having the requisite color balance.

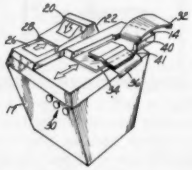
The foregoing abstract is neither intended to define the invention disclosed in the specification, nor is it intended to be limiting as to the scope of the invention in any way.

3,825,338

OPTICAL SYSTEM WITH SELECTABLE FEEDS

James A. Kolibas, Broadview Heights, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Oct. 12, 1972, Ser. No. 297,138
Int. Cl. G03b *27/10*
U.S. Cl. 355—50 **8 Claims**



A duplicating machine which accepts original documents either in a flow-feed mode in which the documents move across the illumination station of an optical system in one direction only or in a platen-feed mode in which three-dimensional documents such as books are transported relative to the same illumination station in feed and return directions by a reciprocable carrier or platen. The mechanism for flow-feed is

also mounted on the carrier or platen. The optical system casts an image of a portion of the original document or all of the document on a photoconductive drum. By means of a novel drive system, movement of the documents is accurately synchronized with movement of the drum on which they are imaged, to produce high image resolution even when the dual feed mechanism is employed in a progressively scanning optical system.

3,825,339

SURFACE EXPOSURE DEVICE FOR COPYING APPARATUS

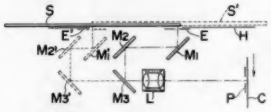
Masaya Ogawa, Toyokawa, Japan, assignor to Matsushita Seiko Company, Limited, Osaka City, Japan

Filed Mar. 15, 1973, Ser. No. 341,782

Claims priority, application Japan, Mar. 29, 1972, 47-31389

Int. Cl. G03b *27/48, 27/50, 27/70*

U.S. Cl. 355—51 **5 Claims**



A surface exposure device for use in a copying apparatus essentially comprising a supporting surface for supporting thereon an original from which a duplicate is desired, a lens assembly, a first carriage having therein a reflective mirror and a second carriage having therein at least one reflective mirror. The first and second carriages are conjointly displaceable in the same direction while the first carriage and the support surface undergo relative motion in opposite directions with respect to each other. Copying material on which the image of the original is to be reproduced is transferred at a velocity substantially equal to the relative velocity of movement of the supporting surface and the first carriage, the second carriage being moved at a velocity substantially equal to one-half of the velocity of the first carriage.

3,825,340

FREQUENCY MODULATION TELEMETRY SYSTEM

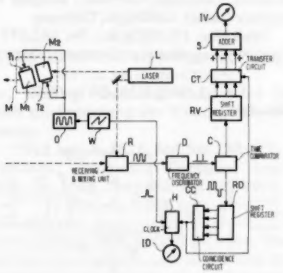
Hubert Debart, Meudon, France, assignor to Compagnie Generale D'Electricite, Paris, France

Filed Dec. 4, 1972, Ser. No. 311,614

Claims priority, application France, Dec. 3, 1971, 71.43502

Int. Cl. G01p *3/36*

U.S. Cl. 356—5 **5 Claims**



A frequency modulation telemetry system in which the radiation sent out towards the target is that of a laser, frequency modulated according to a pseudo-random sequence of increasing and decreasing ramps. The recognition of the sequence, on return, is effected through time intervals between the successive passes of the return frequency through a fixed reference frequency.

3,825,341

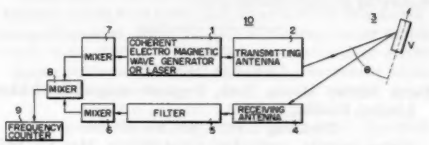
DOPPLER RADAR USING LASER

Kenya Goto, Yohohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed June 11, 1971, Ser. No. 152,386

Int. Cl. G01p *3/36*

U.S. Cl. 356—28 **9 Claims**



A Doppler radar comprising a mode-locked laser oscillating in a single longitudinal mode which generates a laser beam including a plurality of electromagnetic waves of an equal frequency interval; a light transmitting telescope for directing said laser beam to a moving object; a light receiving telescope for receiving from the moving object a plurality of reflected waves subjected to Doppler shift; a photofilter for eliminating background noises from output beam of the light receiving telescope; a photodiode for mixing said plurality of waves and drawing out from the waves only the signal which has a frequency corresponding to the aforementioned equal frequency interval; a photomultiplier for mixing a plurality of reflected waves after their passage through the photofilter and drawing out from the reflected waves only the signal which has a frequency interval corresponding to the equal frequency interval of the transmitted waves; a circuit for mixing outputs from the photodiode and photomultiplier and a frequency counter for counting the frequency of the output signal from the mixing circuit to detect the relative speed of the moving object to that of the observing body.

3,825,342

COMPUTING TYPE OPTICAL ABSORPTION MIXTURE ANALYZER

Dietrich Werner Lubbers, Dortmund; Reinhard Wodick, Dortmund-Loh, and Dieter Piroth, Dortmund-Barup, all of Germany, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e. V., Gottingen, Germany

Filed May 8, 1972, Ser. No. 251,538

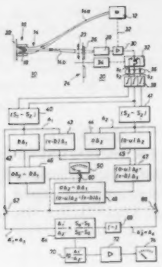
Claims priority, application Germany, May 7, 1971, 2122655

Int. Cl. G01n *33/16*

U.S. Cl. 356—41 **9 Claims**

The proportional concentration of a given substance in a mixture of substances, e.g. the specific oxyhaemoglobin con-

tent of blood, is determined by an apparatus which measures the absorption, by the mixture, of electromagnetic radiation,



as light, at three specific wavelength and calculates and indicates the desired concentration.

3,825,343

OPTICAL DEVICES

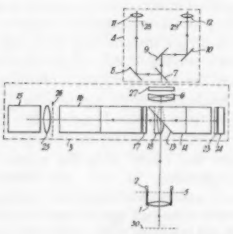
Derek Stanley Moore, York, England, assignor to Vickers Limited, London, England

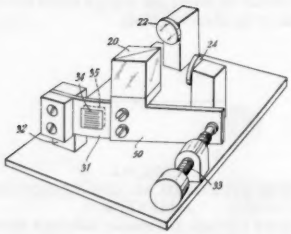
Filed May 2, 1973, Ser. No. 356,332

Claims priority, application Great Britain, May 11, 1972, 22234/72

Int. Cl. G01b *11/00*

U.S. Cl. 356—156 **10 Claims**





An optical device comprises an optical member carried at one end of a flexure spring of which an opposite end is secured to a firm support portion. A light beam incident on the optical member is deflected to an extent that depends on the degree of flexure of the flexure spring, and a strain gauge carried by the flexure spring provides an electrical measure of the said degree of flexure.

3,825,344

DEVICE FOR ANALYSING A SUBSTANCE BY ATOMIC ABSORPTION WITH BACKGROUND CORRECTION

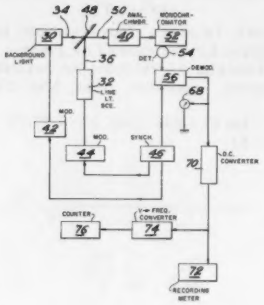
Roger Bonne, Malakoff, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Sept. 6, 1972, Ser. No. 286,844

Claims priority, application France, Sept. 14, 1971, 71.33035

Int. Cl. G01j *3/42*

U.S. Cl. 356—85 **5 Claims**



The invention relates to a device for analysing a substance by atomic absorption with background correction in which the substance is vaporised in a chamber and light beams are transmitted through the vapour from two light sources, one of which has a band wavelength spectrum while the other has a line spectrum, one of the lines being centred at the atomic absorption wavelength. A monochromator is centred at the atomic absorption wavelength for alternately receiving the light beams and a photoelectric detector is disposed at the monochromator output for supplying electric signals. According to the invention electric modulators act on the electric supplies to the light sources for modulating the light beams substantially in the form of square waves of equal duration. The modulators are synchronised with one another and with comparison means which compares the electric signals supplied by the detector. A stationary semi-transparent mirror is disposed in the path of the two beams so that the beams follow the same path from the mirror to the monochromator.

3,825,345

METHOD OF AND APPARATUS FOR USE IN MEASURING THE PARTICLE SIZE DISTRIBUTION AND/OR THE CONCENTRATION OF PARTICLES IN SUSPENSION IN A GASEOUS DISPERSING MEDIUM

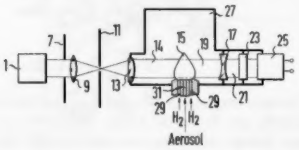
Gerhardt Lorenz, Gottingen, Germany, assignor to Sartorius-Membranfilter GmbH, Gottingen, Germany

Filed Mar. 19, 1973, Ser. No. 342,477

Claims priority, application Germany, Mar. 22, 1972, 2213859

Int. Cl. G01j *3/30*; **G01n** *15/02*

U.S. Cl. 356—85 **19 Claims**



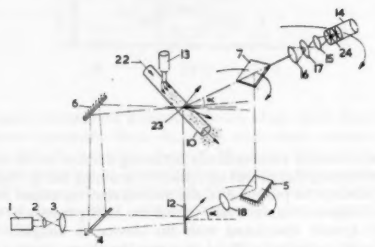
For measuring particle size distribution and/or particle concentration of particles in suspension in a gaseous dispersing

medium, particles are admitted singly and in succession to an evaporation zone of an atomic absorption spectrometer in which absorption and emission pulses modulate a pulsating light beam which activates a photo-multiplier, the signals from the photo-multiplier being fed to circuitry arranged to interpret the signals to provide an analysis of particle size distribution or concentration.

3,825,346
INTERFEROMETERS FOR FLUID FLOW MEASUREMENTS

Joseph Edward Rizzo, Hythe, Nr. Southampton, England, assignor to The Secretary of State for Defence in Her Brittanic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Apr. 16, 1973, Ser. No. 351,759
Claims priority, application Great Britain, Apr. 17, 1972, 17562/72
Int. Cl. G01b 9/02
U.S. Cl. 356—106 **4 Claims**



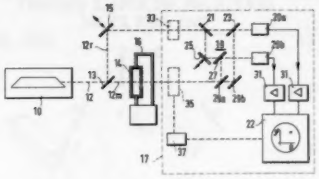
An interferometer for detecting the velocity of small particles in a fluid includes relatively static means comprising a source of coherent radiation and a beam splitter means mounted in a fixed relationship for directing beams of coherent radiation from the source along two predetermined paths comprising a test path which will pass through the fluid under test and a reference path, and a scattering means mounted in the reference path for scattering the radiation in that path into a plurality of angles; and rotatable means, comprising a structure pivotably connected to said static means and rotatable about an axis which passes through the intersection of the reference path with the scattering means and through the intersection of the test path with the fluid under test, and optical components mounted on the said structure comprising recombination means for interferingly recombining radiation scattered into identical angles from both paths and thereby forming interference fringes which indicate the local velocity of the fluid under test.

3,825,347
APPARATUS FOR DETERMINING A SUBSTANCE BY AN OPTICAL RADIATION

Nils Kaiser, Gauting, Germany, assignor to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.v., Gottingen, Germany

Filed Aug. 9, 1971, Ser. No. 170,207
Claims priority, application Germany, Aug. 7, 1970, 2039382; Sept. 14, 1970, 2045386; Nov. 25, 1970, 2058064
Int. Cl. G01b 9/02
U.S. Cl. 356—107 **15 Claims**

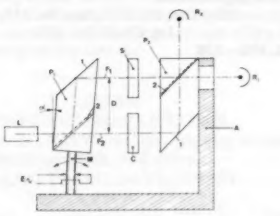
A laser produces a beam of optical radiation. The substance to be determined may be CO_2, and in this case the laser is a CO_2-laser. Alternatively, the laser may be a tunable laser, and the beam is split by a beam splitter into sample and reference beams, the sample beam being relatively modified by said substance. The modified beam and the reference beam are united and the united beam is sensed by a detector. The optical lengths of the paths transversed by the reference and sample beams are exactly the same save the influence of said substance. A preferred sensing system indicates both the phase shift and attenuation of the sample beam by the substance to be determined.



3,825,348
PROCESS OF OPTICAL PATH MODULATION AND MODULATOR FOR IMPLEMENTATION OF THE SAME

Georges Nomarski, Villon Bourg-la-Reine, and Gerard Roblin, Ivry, both of France, assignors to Etablissement Public: Agence Nationale De Valorisation De La Recherche Anvar, Neuilly S/Seine, France

Filed Nov. 27, 1972, Ser. No. 309,797
Claims priority, application France, Dec. 3, 1971, 71.43510
Int. Cl. G01b 9/02
U.S. Cl. 356—107 **11 Claims**



The invention concerns a process and a device for optical path modulation.

The process lies in modulating the optical path difference between both waves of an interferometer by alternate variation of the relative inclination of two components of the interferometer due to the action of a modulator producing an alternate flexure, in creating a modulated optical phase variation causing a change in the modulated light flux and in using the signal provided by a photo-sensitive receiver submitted to this flux for measuring or detecting a phenomenon producing an optical phase difference submitted to the action of the optical path modulator.

The invention applies to metrology, ellipsometry, refractometry, polarimetry, etc.

3,825,349
POINT REFERENCE INTERFEROMETRY

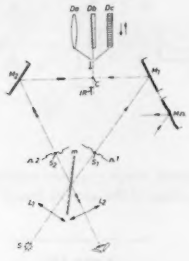
Georges Nomarski, Bourg-La-Reine, France, assignor to Etablissement Public: Agence Nationale de Valorisation de la Recherche, Neuilly S/Seine, France

No Drawing. Filed Nov. 27, 1972, Ser. No. 309,798
Claims priority, application France, Dec. 3, 1971, 71.43511
Int. Cl. G01b 9/02
U.S. Cl. 356—107 **22 Claims**

The invention relates to improvements to point reference interferometry.

These improvements are characterized by the fact that within an optical circuit derived from the Sagnac interferome-

ter and comprising a beam splitter M and a series of plane mirrors (M_1, M_2) sending the beam coming from the beam splitter (M) back to the same beam splitter, an object having a phase Ω_1 is placed inside the circuit so compared. A refracting or diffracting transparent element causes an important change in the direction of the light rays traversing it at a point conjugated with itself or self-conjugated with respect to said beam splitter M.



The invention applies both to microscopy and macroscopy.

3,825,350

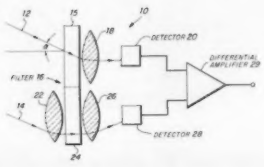
RADIATION SENSING SYSTEM

Donald W. Wilmot, Nashua, N.H., assignor to Itek Corporation, Lexington, Mass.

Filed Dec. 29, 1972, Ser. No. 319,429

Int. Cl. G01b *11/26*

U.S. Cl. 356—138 **5 Claims**



A system for detecting and providing positional information on a source of monochromatic radiation at a given wavelength of interest. The system includes an angle sensitive detection subsystem, which varies its response as a function of angle of incidence of incident radiation, and an angle insensitive detection subsystem which has a uniform response for differing angles of incidence of incident radiation. The system utilizes a dielectric filter tuned to the given wavelength of interest which has the characteristic of varying its spectral filtering response as a function of the angle of incidence of radiation. In the angle insensitive subsystem an optical system gathers radiation from the field of view and passes it at a substantially perpendicular angle through a first portion of the dielectric filter for detection by a first detector. In the angle sensitive subsystem radiation from the entire field of view is directed through a second portion of the dielectric filter at varying angles of incidence depending upon the position of each source of radiation in the field of view for detection by a second detector. A differential amplifier compares the outputs of the two photodetectors. The magnitude of the difference between the two photodetector signals will vary monotonically as the source of radiation is positioned at angles further from a perpendicular to the dielectric filter, and accordingly the signal may be used for providing positional information on the source. Also, because of the characteristics of a dielectric filter, the first and second detectors will produce equal output signals for broad frequency band sources of radiation and accordingly the output of the differential amplifier will be zero for those sources.

3,825,351

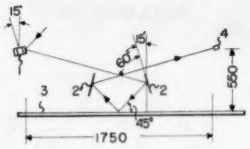
AUTOMATIC SURFACE INSPECTION DEVICE FOR RUNNING OBJECT

Takeo Seki; Shigenori Kawamura, both of Kokubunji; Itsuji Maeda, Akishima, and Akira Kaneko, Kokubunji, all of Japan, assignors to Hatachi Electronics Co., Ltd. and Nisshin Steel Co., both of Tokyo, Japan

Filed Jan. 19, 1973, Ser. No. 325,054

Int. Cl. G01n *21/32*

U.S. Cl. 356—200 **5 Claims**



A device for automatically detecting defects on the surface of a running flat object by optically scanning the surface and converting the presence of the defects into variations in electrical signals, characterized in that the configuration of an optical system associated with the device is adapted to be changed as desired without changing the characteristics of the optical system.

3,825,352

AUTOMATICALLY ACTUATED LIGHT MEASURING SYSTEM

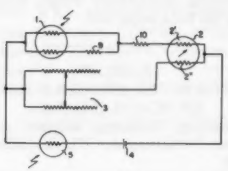
Naoyuki Uno, Iruma-gun, Saitama-ken, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed May 27, 1969, Ser. No. 828,274

Claims priority, application Japan, June 5, 1968, 43-37980

Int. Cl. G01j *1/44*

U.S. Cl. 356—226 **7 Claims**



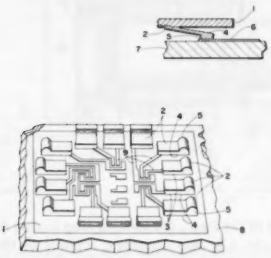
An automatically energized light measuring system comprises a null type electrical measuring network such as a differential meter including a light measuring first photoconductor connected in series with one coil and a variable resistor connected in series with the other coil, or a bridge including a variable resistor in one leg and the first photoconductor in another leg. The electrical measuring network is connected through a second photoconductor to an energizing battery.

3,825,353

MOUNTING LEADS AND METHOD OF FABRICATION

Alberto Loro, Ottawa, Ontario, Canada, assignor to Microsystems International Limited, Montreal, Quebec, Canada

Filed July 12, 1972, Ser. No. 271,150
Claims priority, application Canada, June 6, 1972, 144,012
Int. Cl. H01l 5/00
U.S. Cl. 317—234 R 10 Claims



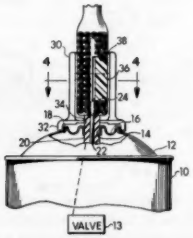
A beam terminal for a semiconductor chip which does not cantilever outwardly from the chip, and which extends no further than the boundary thereof. The beam terminal is adherent to the chip at one position, allowing the remainder thereof to flex with applied stress. The beam terminalled chip thus may be handled using economical mass production techniques.

3,825,354

TOOTHBRUSH ADAPTER FOR AEROSOL CONTAINER

Theodore Rallis, Beacon Falls, Conn. 06403

Filed July 9, 1973, Ser. No. 377,828
Int. Cl. A46b 11/02
U.S. Cl. 401—119 5 Claims



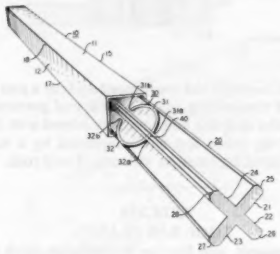
A toothbrush has a hollow head into which head the user can inject toothpaste from an aerosol can. The aerosol can includes a valve in its upper portion which is spring loaded closed and adapted to be opened in response to pressure on a cylindrical plug extending upwardly through the top of the can. An adapter mounted on the aerosol can is adapted to receive the toothbrush so that it can be guided into a position which permits the user to push on the handle of the toothbrush to actuate the valve, and an injector tube also provided in the top of the aerosol can is received in an end opening associated with the hollow head of the toothbrush so that the user can grasp the aerosol can in one hand on the toothbrush in the other and thereby load his toothbrush in an efficient manner.

3,825,355

INTERLOCKING JOINT

Frank Herbert Martin, Holmdel, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed July 2, 1973, Ser. No. 375,613
Int. Cl. F16b 1/00
U.S. Cl. 403—104 12 Claims



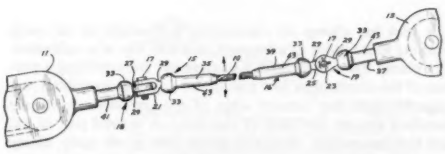
An interlocking joint includes a hollow outer leg having three or more sidewalls which intersect to form at least three vertices, an inner leg member which includes at least three interconnected flanges each of which extend into one of the vertices, and securing means affixed to the inner leg that holds the legs in desired relative position by bearing on one or more sidewalls of the outer leg and thus urges certain of the flanges toward their corresponding vertices.

3,825,356

TWO-PIECE SWAGE FITTINGS

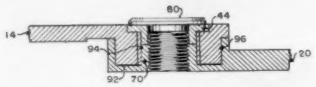
Edward J. Crook, Jr., Fort Wayne, Ind., assignor to American Hoist & Derrick Company, St. Paul, Minn.

Filed July 14, 1972, Ser. No. 271,991
Int. Cl. F16g 11/02
U.S. Cl. 403—122 7 Claims



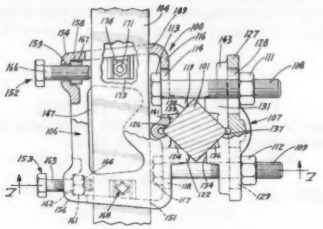
A two-piece swage socket is made up of interconnected shank and pin receiving sections. The shank section is made of steel having a spheroidize annealed microstructure. One end of this shank section is initially provided with an outwardly open, axially aligned, cylindrical cup portion, while the other end is constituted as an axially aligned, open, hollow cylinder adapted to be cold swaged upon a wire rope. The swage pin receiving section is made of steel having a substantially harder and stronger microstructure, and one end of it is constituted as a part spherical ball portion integrally connected through a narrowed neck either to a pin receiving clevis or tongue end piece at the other end. To make up the swage socket, the ball portion of the pin receiving section is inserted into the cup of the shank section and the outer end region of the cylindrical cup is cold formed onto the ball portion to provide a connection between the shank section and the pin receiving section such that these parts can be rotated and oscillated one with respect to the other.

3,825,357
JOINT FOR AN ARTIFICIAL LIMB
Edward W. Hilton, 2132 1st Ave., Seattle, Wash. 98121
Filed May 8, 1972, Ser. No. 251,217
Int. Cl. F16c *11/00*
U.S. Cl. 403—161 **4 Claims**



A pivot joint between the overlapped ends of a pair of members, each end terminating in cylindrical end portion extending normal to the member and rotatably nested with the cylindrical end of the other rod and connected by a screw and sleeve unit secured for rotation with one of said rods.

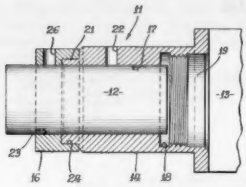
3,825,358
TOOL BAR CLAMP
Fred W. Eisenhardt, and Hartley N. Ellingson, both of Fargo, N. Dak., assignors to Alloway Manufacturing, Inc., Fargo, N. Dak.
Continuation-in-part of Ser. No. 48,258, June 22, 1970, Pat. No. 3,642,333. This application Aug. 30, 1971, Ser. No. 176,169
Int. Cl. F16b *7/00*
U.S. Cl. 403—188 **23 Claims**



A tool bar clamp for connecting a standard of an earth working tool holder to a support, as a tool bar of a cultivator. The clamp has a body with a passageway for receiving a portion of the standard. A first pair of nut and bolt assemblies, engageable with the forward edge of the standard, clamp the standard against the back of the body. A second pair of nut and bolt assemblies, mounted on the side of the body, clamp the side of the standard in the body to fix the lateral and perpendicular position of the standard in the clamp. The body is mounted on the support with a retainer and a pair of nut and bolt assemblies. The retainer and body have projections or legs that can accommodate tool bars having square, diamond and T shapes.

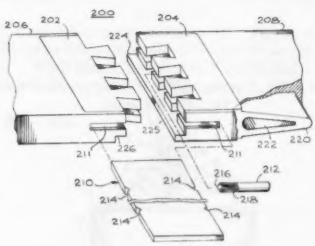
3,825,359
RELEASABLE MOUNTING FOR CYLINDRICAL OBJECTS
Clyde E. Fulton, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed July 14, 1972, Ser. No. 272,056
Int. Cl. F16b *2/18*
U.S. Cl. 403—192 **2 Claims**

A compact economically manufactured mounting device provides for disengageably fastening cylindrical objects, such as electrical circuit elements or the like, to a support member. A tubular base is attachable to the support and has an internal passage for receiving a portion of the cylindrical object to be mounted thereon. The end of the base into which the cylindrical object extends has an annular outer surface which is eccentric relative to the internal passage. A locking ring encircles another portion of the cylindrical object and is abutted



against the end of the base, the locking ring having an annular inner surface which is also eccentric relative to the passage through the ring and which is fitted against the eccentric outer surface of the base. Turning of the ring relative to the base then tightly clamps the base, locking ring and cylindrical object together.

3,825,360
JOINT APPARATUS FOR SECTIONED SKIS OR THE LIKE
Thomas Patrick Galich, 33552 Palo Alto, Dana Point, Calif. 92629
Continuation-in-part of Ser. No. 167,610, July 30, 1971, abandoned. This application June 30, 1972, Ser. No. 267,923
Int. Cl. F16b *12/22*
U.S. Cl. 403—294 **14 Claims**

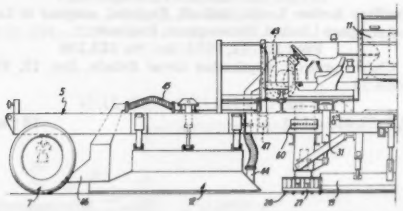


An interconnecting joint for joining together adjacent ends of a pair of planar members such as portions to make up a ski. Key interlocks are formed at the ends of the members which are joined together for interlocking the members and preventing longitudinal separation thereof. Slotted portions are formed in the members for positioning an insert, with a portion of the insert mounted in each of the planar members and secured in place by easily removable retainers. The insert provides additional support for the joint and prevents undesired transverse flexing of the members at the joint. The joint provides a generally unitary structure having the same cross-sectional dimensions as each of the members at the joint with no protruding portions. Moreover, the joint allows ready separation of the planar members to permit packing of the members for transportation in a more compact array.

3,825,361
ROAD PLANING MACHINES

Hubert Steiner, Stoke-On-Trent, England, assignor to H. Steiner Limited, Staffordshire, England

Filed July 21, 1972, Ser. No. 273,890
Claims priority, application Great Britain, July 23, 1971, 34591/71
Int. Cl. E01c *23/12*
U.S. Cl. 404—90 **23 Claims**

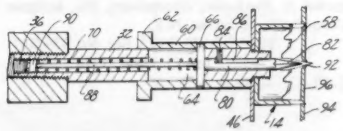


A road planing machine having a cutter assembly and a collecting and elevating assembly, the cutter assembly comprising a series of side-by-side rotary cutter wheels arranged transversely of the direction of movement of the machine in use, the cutter wheels being interlocked for rotation in unison and each being driven by an individual hydraulic motor supplied from a common pressure source. The machine may include a heating unit mounted forwardly of the cutter assembly, the heating unit preferably being gas fired and the gas supply pipes for the heater and oil return pipes from the cutter motors effecting a heat exchange. Air may be drawn from the heater and passed over it to the front of the machine to be directed downwards on to the road to pre-heat the latter.

3,825,362
ARBOR FOR AN ANNULAR HOLE CUTTER

Everett D. Hougen, G-5072 Corunna Rd., Flushing, Mich. 48504

Filed Feb. 26, 1973, Ser. No. 335,826
Int. Cl. B23b *47/00, 51/04*
U.S. Cl. 408—68 **7 Claims**



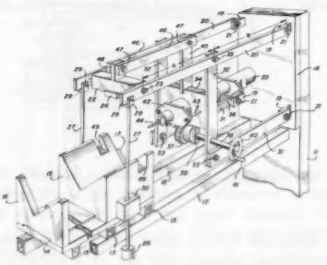
A cup-shaped annular cutter for forming circular holes in workpieces mounted on the end of an arbor, the arbor being provided with a center pilot member adapted for ejecting the center slug resulting from the opening cut by the cutter. The arbor preferably has a sleeve mounted for axial sliding movement on the shank of the arbor with a transverse pin on the sleeve extending through a slot in the arbor for engaging the inner end of the pilot member.

3,825,363
CENTER DRILLING HOLD-DOWN DEVICE

Robert W. Lanman, Munster, Ind., assignor to Hadady Machining Co., Inc., Lansing, Ill.

Filed Dec. 21, 1972, Ser. No. 317,628
Int. Cl. B23b *45/14*
U.S. Cl. 408—104 **17 Claims**

An apparatus for automatically aligning a hydraulic drill with the longitudinal axis of a piece of stock material so that a centering hole may be drilled therein to facilitate subsequent machining of the stock is disclosed. More particularly, the apparatus includes a linkage comprising a pair of horizontally displaced bars coupled to a substantially flat frame member so that each is pivotable in a vertical plane normal to the frame. A second, shorter pair of pivoted bars is similarly positioned directly below the first pair. The free-moving end of each short bar, in turn, is coupled to an intermediate point on the corresponding by a vertical bar so that the linkage forms a pair of parallelograms. A hold-down means, attached to the free-

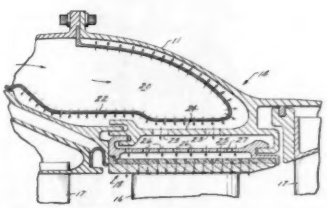


moving ends of the longer outwardly extending bars, is positioned to contact the upper surface of the stock as it rests in a V-shaped stock support so that the stock is secured in position for drilling with its end surface parallel to the frame. A drill is mounted between the vertical bars so that it is normal to the end of the stock. Accordingly, when the holddown contacts the top surface of the stock, the drill is automatically aligned with the longitudinal axis of the stock so that a centering hole can be drilled.

3,825,364
POROUS ABRADABLE TURBINE SHROUD

Ely E. Halila, and Albert P. Sterman, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed June 9, 1972, Ser. No. 261,375
Int. Cl. F01d *5/08, 5/20*
U.S. Cl. 415—116 **3 Claims**



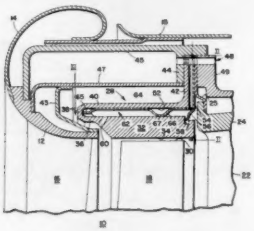
A turbine blade tip-sealing shroud between a rotating bladed turbine and the surrounding casing of a turbojet engine is formed of substantially cylindrical inner and outer layers of porous sintered metal or similar material. The porosity of the radially inner layer is greater than the porosity of the outer layer and is adapted to withstand frictional rubbing contact with the turbine. The outer layer of the shroud is impinged by cooling air for transpiration cooling of the shroud, the amount of cooling air passed therethrough being metered by the porosity of the outer layer. The relative porosities of the two layers enable the shroud to meter the flow of cooling air to maintain this flow in spite of abrasion of the inner layer and the constriction of the pores thereof by the rotating bladed turbine.

3,825,365

COOLED TURBINE ROTOR CYLINDER

Yao Peng, Milford, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Feb. 5, 1973, Ser. No. 329,480
Int. Cl. F01d *5/08, 11/08, 25/26*
U.S. Cl. 415—117 **9 Claims**



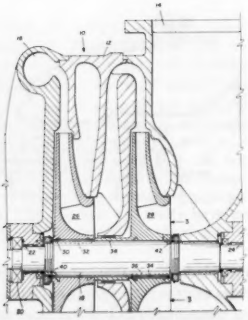
An air-cooled turbine rotor cylinder comprising an inner ring positioned adjacent the tips of a plurality of turbine blades attached to a turbine disc. An integral outer ring and an integral web form an annular space between the rings. Cooling air is supplied to the open end of the annular space and exits through ports upstream of the turbine blades to cool the inner ring. A baffle having a series of ribs is provided in the annular space and acts to provide a short path for cooling air at lower temperatures and a substantially longer flow path at higher temperatures. This acts to minimize the variation in radial thermal growth in the inner ring.

3,825,366

ASSEMBLY FOR CENTRIFUGAL BLOWERS AND THE LIKE

David Burton Herrick, Connersville, Ind., assignor to Dresser Industries Inc., Dallas, Tex.

Filed July 31, 1972, Ser. No. 276,807
Int. Cl. F04d *29/28, 17/00*
U.S. Cl. 415—131 **2 Claims**



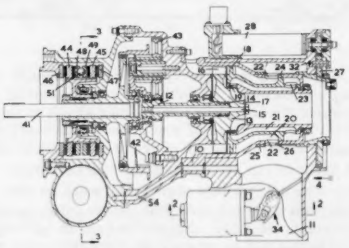
An improved rotor and shaft assembly for a centrifugal blower, compressor, or the like that includes a shaft constructed from a material having a first coefficient of thermal expansion and a rotor located on the shaft and constructed from a material having a second coefficient of thermal expansion that is greater than the first coefficient of thermal expansion. Abutments are provided on the shaft that engage the rotor hub to limit the thermal expansion of the rotor in the axial direction to the same expansion as that of the shaft and to convert any excess axial thermal expansion of the rotor into an inwardly deformation of the hub, whereby, the hub more tightly engages the shaft. The arrangement permits the rotor to be slipped onto the shaft during assembly and to be slipped off the shaft during disassembly while at the same time providing for the operation of the blower or compressor at elevated temperatures without loosening of the rotor on the shaft.

3,825,367

REVERSIBLE TURBINE WITH INLET AND BRAKE CONTROL SYSTEM

Geoffrey Arthur Lewis, Solihull, England, assignor to Lucus Aerospace Limited, Birmingham, England

Filed Jan. 12, 1973, Ser. No. 323,236
Claims priority, application Great Britain, Jan. 12, 1972, 1404/72
Int. Cl. F01d *1/30, 17/00, 21/14*
U.S. Cl. 415—153 **18 Claims**



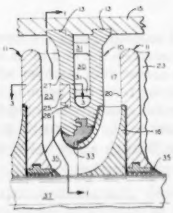
A turbine includes a rotor having two sets of blades, gas flow through one blade set urging the rotor in the opposite direction to gas flow through the other blade set. A valve between the rotor and the turbine inlet enables gas flow to the blade sets to be selectively controlled, an increased flow to one of the sets being preceded by a decreased flow to the other set.

3,825,368

DIAPHRAGM STRUCTURE FOR A MULTI-STAGE CENTRIFUGAL GAS COMPRESSOR

Herschel A. Benjamin, Greensburg, Pa., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Feb. 28, 1973, Ser. No. 336,847
Int. Cl. F04d *29/44*
U.S. Cl. 415—199 A **3 Claims**



The diaphragm structure for multi-stage centrifugal compressors consists of two pieces cast separately. One piece is fixed at its periphery in the compressor casing in the conventional manner. The second piece is spaced in a direction axially of the compressor from the first piece to form in conjunction therewith a gas inlet passage terminating at the intake of the impeller. The second piece is spaced from the first piece by a plurality of radially disposed vanes formed integral with the second piece. The side surface of the first piece confront-

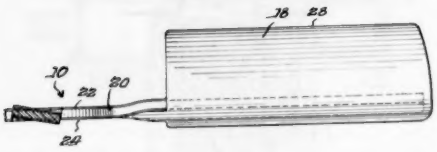
ing the second piece is formed with a recess. Said vanes are formed at their free edges with a circular rib disposed in the recess. The rib and recess are formed with integral interlocking means.

3,825,369

LIGHTWEIGHT FAN

R. Richard Albertzart, Okemos, Mich., assignor to Hayes-Albion Corporation, Jackson, Mich.

Filed Sept. 13, 1972, Ser. No. 288,762
Int. Cl. F04d *29/38*
U.S. Cl. 416—229 **3 Claims**



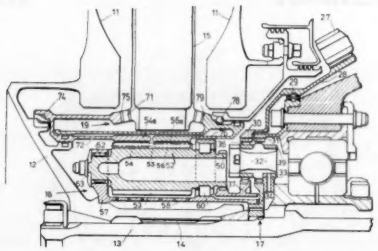
A lightweight automotive fan having a plastic core and high strength metal sheets applied to the front and rear faces of the core.

3,825,370

PITCH VARYING MECHANISM FOR VARIABLE PITCH FAN

David Roberts McMurtry, and Michael John Agg, both of Bristol, England, assignors to Rolls-Royce (1971) Limited, London, England

Filed Dec. 6, 1972, Ser. No. 312,754
Claims priority, application Great Britain, Dec. 11, 1971, 57658/71
Int. Cl. B64c *11/32*
U.S. Cl. 416—160 **7 Claims**



The blades of a variable pitch fan of a gas turbine engine are rotated about their longitudinal axes as well as about the axis of the engine by a gear system which comprises a stationary actuator which initiates the pitch varying movement by producing a rotary output corresponding to the degree of pitch change required, an epicyclic differential gear driven by this output and the engine main shaft, and arranged to produce an output corresponding to the sum of the rotary output and the shaft rotational speed, and a pitch changing gear adapted to be driven by the output of the differential gear and to produce relative rotation of two annulus gears connected to rotate the fan blades about their own axes.

3,825,371

FASTENING OF EROSION PROTECTIVE STRIPS TO AIRCRAFT PROFILES

Wolfgang Roder, Pinneberg; Wolfgang Volkner, Rellingen, and Dieter Rusch, Holstein, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Oct. 27, 1972, Ser. No. 301,678
Claims priority, application Germany, Oct. 27, 1971, 2153434
Int. Cl. B64c *11/20*
U.S. Cl. 416—224 **10 Claims**

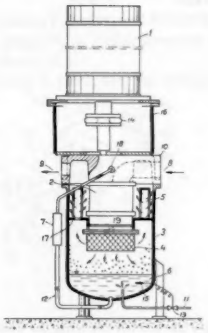
An elastic adhesive, which is hydrophobic, possesses a high breaking strength, a low modulus of elasticity, a high resistance to peeling and shear and good vibration characteristics is used to fasten protective strips to the profiled portions of an aircraft.

3,825,372

COMPACT COMPRESSOR UNIT

Anders Lundberg, and Rolf Axelsson, both of Norrkoping, Sweden, assignors to Stal Refrigeration AB, Vasteras, Sweden

Filed Dec. 18, 1972, Ser. No. 316,291
Claims priority, application Sweden, Dec. 23, 1971, 16587/71
Int. Cl. B01d *45/00;* **F25b** *43/02;* **F01c** *21/04*
U.S. Cl. 417—321 **4 Claims**



A refrigeration compressor unit comprising a compressor, a motor and an oil separating system, wherein the compressor is mounted within the oil separator housing, and the motor is mounted on the compressor.

3,825,373

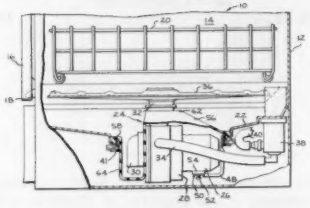
DISHWASHER ASSEMBLY

Thomas E. Jenkins, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 2, 1973, Ser. No. 320,617
Int. Cl. F04b *21/00*
U.S. Cl. 417—360 **9 Claims**

A dishwashing machine is disclosed having an interior wash chamber and a unitized motor-pump assembly mounted in sealed relation in a bottom opening of the chamber whereby a portion of the assembly projects upwardly above the cham-

ber's bottom wall. The motor-pump assembly is designed to be installed in the machine by downward insertion through the wash chamber and into a suspended position within the opening provided therefor. The unitized motor-pump assembly includes a membrane-like flexible shroud that covers the assembly and has a circumferential edge adapted to serve as an



annular seal between the assembly and the annular chamber bottom wall lip defining the bottom wall opening. A means for compressibly sealing the motor-pump assembly to the bottom wall includes a clamping arrangement adapted to exert a radially inward clamping force that is translated vertically to draw the motor-pump assembly downwardly relative to the wash chamber bottom wall and tightly seal it therewith.

3,825,374

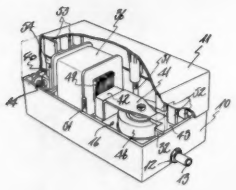
AIR SUPPLY DEVICE

Ryozo Kondo, 19-5, Ikegami 1 Chome, Ohta-Ku, Tokyo, Japan

Filed Mar. 9, 1972, Ser. No. 233,092

Int. Cl. F04b *35/04, 43/00*

U.S. Cl. 417—413 **8 Claims**



An air supply device for blowing air bubbles into an aquarium. An electro-magnet creating an alternating magnetic field to actuate a vibrating arm is provided with a core having concave poles, and the electromagnet and the vibrating arm which is disposed opposite to the concave poles are held by supporting members integrally molded with an upper and lower casing of the air supply devices.

3,825,375

ROTARY DRIVING

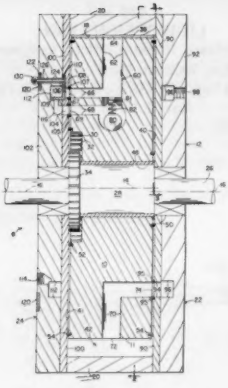
Nicholas B. Deane, 1558 Massachusetts Ave., Cambridge, Mass. 02138

Filed Jan. 5, 1972, Ser. No. 215,544

Int. Cl. F01c *1/02, 21/12;* **F04c** *17/02*

U.S. Cl. 418—61 A **32 Claims**

A rotary device of the type comprising a housing defining a first trochoidal internal profile between a pair of end walls and a rotor rotatable within the housing defining at its periphery a second trochoidal surface, the housing profile and rotor surface defining working chambers the volume of which expand and contract during relative rotation of the rotor and housing,



and the rotor and housing defining conduits and porting for introducing fluid into the working chambers through the rotor.

3,825,376

VALVE ARRANGEMENT FOR FLUID PRESSURE MOTOR OR PUMP

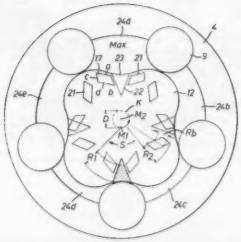
Carsten Georg Otto Petersen, Hohe Buch, and Svend Giversen, Ulkebol, both of Denmark, assignors to Danfoss A/S, Nordberg, Denmark

Filed Nov. 10, 1972, Ser. No. 305,599

Claims priority, application Germany, Nov. 10, 1971, 2155818

Int. Cl. F04c *1/06*

U.S. Cl. 418—61 B **5 Claims**

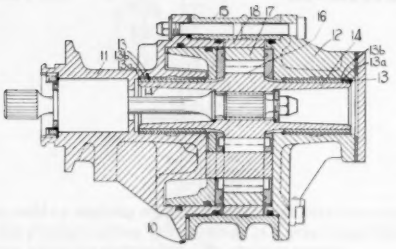


The invention relates to a gerotor type motor or pump in which the valving is between the gerotor star member and the adjacent casing wall. A separate valve member, as such, is not provided. The valving includes recesses formed in the star, each of which sequentially moves into fluid communication with inlet and outlet recesses formed in the casing wall. The star member has the usual combined rotary and orbital movements and the valve recesses are accordingly formed or shaped to accommodate this compound movement.

3,825,377
GEAR PUMPS AND MOTORS

Harry Simister Bottoms, Solihull, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Apr. 28, 1972, Ser. No. 248,381
Claims priority, application Great Britain, Apr. 28, 1971, 11774/71
Int. Cl. F01c 1/10, 21/00
U.S. Cl. 418—170 6 Claims

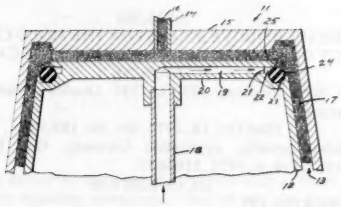


A gear type pump or motor has its gears supported in bearings mounted in bearing support portions of the housing with the whole of the pump interior containing fluid. The housing and gears are made of different materials e.g., titanium and steel respectively, so that the bearing clearance is reduced as the temperature rises to compensate for the reduced viscosity of the working fluid.

3,825,378
MOLD APPARATUS

William A. Dart, Mason, and James R. Davis, Okemos, both of Mich., assignors to Dart Container Corporation, Mason, Mich.

Filed Apr. 13, 1973, Ser. No. 350,689
Int. Cl. B29d 27/00
U.S. Cl. 425—4 R 6 Claims

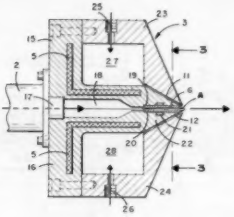


A mold apparatus having a core element provided with a plurality of spaced apart steam and air emitting ports which open into the mold cavity and which are circumferentially positioned within an annular groove provided in the upper portion of the core element. An elastic ring element positioned in the annular groove so as to normally cover the steam and air emitting ports. The elastic ring element being expandable to permit air or steam under pressure to flow from the ports into the mold cavity but normally closing against the ports to prevent the contents of the mold cavity from entering and clogging the steam and air emitting ports and the channels within the core element which lead thereto.

3,825,379
MELT-BLOWING DIE USING CAPILLARY TUBES

Dwight T. Lohkamp, and James P. Keller, both of Baytown, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Apr. 10, 1972, Ser. No. 242,504
Int. Cl. D01d 3/00, 7/00
U.S. Cl. 425—72 16 Claims

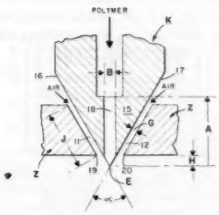


A melt-blowing die which has capillary tubes rather than drilled orifices is more easily fabricated and operates more effectually. Preferably, one end of each capillary tube is machined so as to terminate in an apex having an included angle within the range of 30° to 90°. Or the tubes can have conical ends with the same angle. The inside diameter of these tubes range from 0.010 to 0.025 inch and they connect with a chamber in the die. Preferably the die is a two-piece assembly and is fabricated by bolting the two pieces and including the capillary tubes in a solder layer.

3,825,380
MELT-BLOWING DIE FOR PRODUCING NONWOVEN MATS

John W. Harding; James P. Keller, and Robert R. Buntin, all of Baytown, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed July 7, 1972, Ser. No. 269,624
Int. Cl. B29f 3/04
U.S. Cl. 425—72 9 Claims

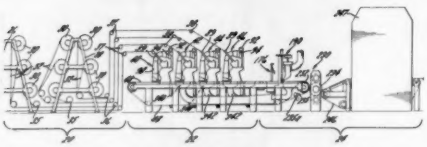


A die having a special nose configuration approximating a triangle in cross section is especially suitable for use in a melt-blowing process for making very fine fibers from thermoplastic materials. A plurality of orifices are located in an edge-apex formed at the juncture of two sides of said triangle. The included angle encompassing said edge is within the range of 30° to 90°. The essential feature of said edge is that there are essentially no dead spaces where polymer can collect during the melt-blowing process. Any point on the edge which is more than about 0.002 inches (2 mils) from where the sides make initial contact with said edge is considered to be a dead space. Another feature of the invention involves air slot adjustment means in combination with said die nose.

3,825,381
APPARATUS FOR FORMING AIRLAID WEBS

Charles E. Dunning, Neenah, and Stanley R. Kellenberger, Appleton, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 145,452, May 20, 1971, abandoned. This application Aug. 1, 1973, Ser. No. 384,705
Int. Cl. B29c 13/00
U.S. Cl. 425—83 39 Claims

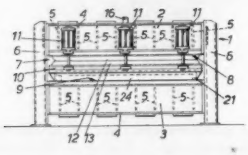


An apparatus for forming airlaid wood fiber webs at high speeds, which webs may be used for sanitary wipe and toweling applications, comprises a means for air laying a wood fiber continuum on to a foraminous carrier, a water spray for wetting the continuum, a transfer roll positioned to accept the wetted continuum surface to strip it from the carrier and a patterned roll with land areas and relieved areas on the roll surface and held in pressure engagement with the transfer roll to compress the continuum to form a closely spaced pattern of deep indentations or bonded zones with fluffy mounds of fibers therebetween.

3,825,382
FILTER PRESS

Maxwell Wingate Davidson, Edinburgh, England, assignor to Maxwell Davidson Limited, Edinburgh, Great Britain

Filed May 24, 1972, Ser. No. 256,248
Int. Cl. B29c 3/00
U.S. Cl. 425—84 21 Claims



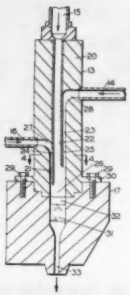
A press for expressing liquids from solids or for forming moulded blocks comprises a frame including a facing pair of upper and lower platens, a filter cloth extending across the lower platen, and a fluid expansible bellows device located between the platens and serving to press material against the filter cloth. The bellows device is comprised by the novel arrangement of a first flexible diaphragm connected to the upper platen and forming a fluid chamber with the upper platen, and an inflatable bag member between said first flexible diaphragm and the lower platen.

The inflatable bag has an upper diaphragm wall back-to-back with said first diaphragm and a lower diaphragm wall for pressing material on the filter cloth, the inflatable bag and the fluid chamber being in fluid communication; and the bellows device includes an inlet for pressure fluid.

3,825,383
APPARATUS FOR PRODUCING MULTILAMINATED FILM

John M. Hoagland, 284 Twin View Dr., Pleasant Hill, Calif. 94523; George M. Tokos, 7335 Hansen Dr., Dudlin, Calif. 94566, and Edward G. Tonn, 1152 Clarendon Cres., Oakland, Calif. 94610

Continuation of Ser. No. 863,735, Aug. 12, 1969, abandoned, which is a division of Ser. No. 492,212, Oct. 1, 1965, abandoned. This application Nov. 14, 1972, Ser. No. 306,282
Int. Cl. B29d 7/04
U.S. Cl. 425—131 4 Claims



An apparatus for producing multilaminated thermoplastic film and embodying means for forming a composite thermoplastic resin plug and enabling the composite resin plug to be expanded widthwise so as to produce in a die manifold of the apparatus a laterally expanded molten plastic resin stream substantially equal in width to that of a multilaminate thermoplastic film which is to be extruded through a long, narrow orifice of the die, there being a converging passageway in the die through which passageway the expanded molten plastic resin from the manifold can flow and meanwhile be compressionally convergently reduced in thickness leading toward the long, narrow orifice of the die thus to have the die issue a multilaminated thermoplastic film.

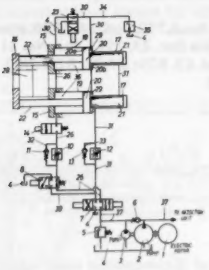
3,825,384
HYDRAULIC DRIVE MEANS FOR THE MOLD CLOSING UNIT OF AN INJECTION MOLDING OR DIE CASTING MACHINE

Karl Hehl, Siedlung 183, D-7291 Lossburg/Wurttemberg, Germany

Filed Oct. 18, 1971, Ser. No. 189,976
Claims priority, application Germany, Oct. 17, 1970, 2051083; Feb. 6, 1971, 2105637
Int. Cl. B29f 1/06
U.S. Cl. 425—137 6 Claims

A hydraulic drive system for the mold closing unit of an injection molding or die casting machine in which drive cylinders are provided in circuit with a pump system which alternatingly provides pressure levels in at least a low pressure range and a high pressure range for the closing unit. In one embodiment, the pump system effects a closing stroke and an opening stroke of the mold by applying a pressure in the low pressure range, and retains the closed state of the mold by applying a pressure in the high pressure range. A slide valve and a pressure setting valve are connected in circuit with the drive cylinders and the pump, with the pressure setting valve opening at a preselected limit pressure which is lower than the lower pressure range, while the slide valve is maintained in an open position during the latter portion of the closing stroke of the mold. In another embodiment, the pump system effects a

closing stroke and an opening stroke of the mold by applying a pressure in the low pressure range, and retains the closed state



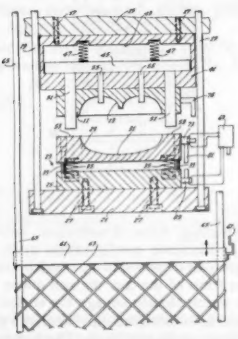
of the mold by applying a pressure in the high pressure range with the pressure setting valve opening at a preselected limit pressure which lies slightly above the pressure ranges.

3,825,385

SELF-CONTAINED DIE PROTECTING DEVICE

Peter Joseph Sesto, Redondo Beach, Calif., assignor to G & S Mold & Die, Inc., Hawthorne, Calif.

Filed Mar. 22, 1972, Ser. No. 237,160
Int. Cl. B28b *17/00*
U.S. Cl. 425—137 **12 Claims**



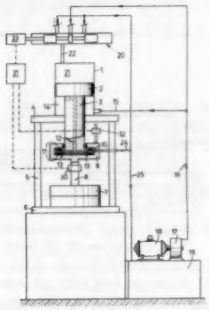
A safety device for the protection of dies such as those used in injection molding operations. One of the die blanks is formed in two sections which are mounted for limited movement relative to one another and spring-biased apart which can be set to any degree of sensitivity by different spring tensions. The other die blank is provided with an ejector plate mounted in the rear portion thereof so that ejector pins normally extended into the mold cavity in order to eject finished products therefrom. The die blanks are mounted on press platens so that they may be moved relative to one another. When the die is closed, the ejector pins are forced out of the mold cavity. A pair of switches are attached to the die blanks in such a way that if any flashing or other foreign material should fail to be ejected from the mold cavity, should fall between the die blanks, or should get behind the ejector plate, the relative movement of the blanks will automatically be reversed before substantially any damage can occur to the die.

3,825,386

PRESSING CONTROL DEVICE

Wolfert Bello; Wijbren van der Meulen, and Pieter Halma, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 19, 1973, Ser. No. 352,585
Claims priority, application Netherlands, May 25, 1972, 7207024
Int. Cl. B29c *3/06*
U.S. Cl. 425—150 **2 Claims**



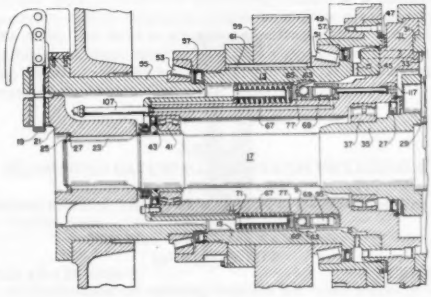
A pressing device for the pressing of synthetic resin materials in a mould, comprising an hydraulic motor which is provided with a piston which is movable in a cylinder, a piston rod being connected to the said piston. Hydraulic pressing liquid can be supplied to the spaces on both sides of this piston by means of a servo valve. The piston rod is provided with a force detector and a displacement detector. The signals supplied by these detectors are compared with adjusted values. As long as the pressing force remains below the adjusted value, the control unit controls the servo valve such that the piston moves at an adjusted speed. When the adjusted pressing force is reached, the control unit controls the servo valve such that the piston rod does not exceed the adjusted pressing force.

3,825,387

QUICK-CHANGE DIE AND ROLLER ASSEMBLY

Robert W. Gilman, San Francisco, Calif., assignor to California Pellet Mill Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 141,303, May 7, 1971, abandoned. This application Mar. 30, 1972, Ser. No. 239,555
Int. Cl. B29f *3/012*
U.S. Cl. 425—182 **12 Claims**



A quick-change die and roller assembly for a pellet mill wherein the quill shaft supporting the die around the extrusion rollers is provided with a quick-release means which is biased by spring pressure to engage a groove to hold the quill shaft in the pellet mill.

3,825,388

APPARATUS FOR THE TREATMENT OF PIGMENTS

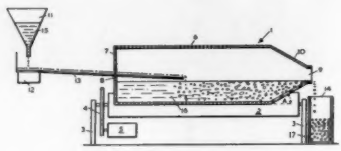
John James Hinley, Middlesbrough, and John Gibson, Stockton-on-Tees, both of England, assignors to British Titan Limited, Billingham, Teesside, England

Filed Mar. 30, 1972, Ser. No. 239,521

Claims priority, application Great Britain, Apr. 7, 1971, 9034/71

Int. Cl. B29b *1/03*

U.S. Cl. 425—222 16 Claims



Apparatus for the pelletisation of inorganic pigment in which a vessel having a circular inner surface is rotatably mounted and has at one end an inlet for the pigment to be pelletised and at the other end an outlet for the pellets with at least a portion of the circular inner surface adjacent the outlet end at an angle to the axis of the vessel which is less than the angle of slip of pellets of the pigment on the material of construction of the inner surface.

3,825,389

MOLDING HOLLOW ARTICLES

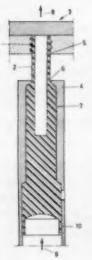
Heinrich Pott, Hilchenbach-Dahlbruch, Germany, assignor to Siemag Siegener Maschinenbau G.m.b.H., Hilchenbach-Dahlbruch, Germany

Filed June 26, 1972, Ser. No. 266,126

Claims priority, application Germany, July 1, 1971, 2132674

Int. Cl. B29d *23/03*

U.S. Cl. 425—324 B 15 Claims



Apparatus for forming a hollow body from thermoplastic material wherein a hollow pre-cast is formed around a blow rod and them blown in a mold, a neck being formed around the blow rod while the pre-cast is being formed.

3,825,390

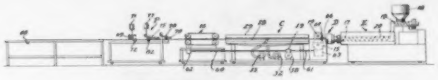
APPARATUS FOR EXTRUDING, EMBOSSING AND CURVING SIDING

Peter F. Heilmayr, and Sol B. Kimbrell, both of McPherson, Kans., assignors to Certain-Teed Products Corporation, Ardmore, Pa.

Division of Ser. No. 2,770, Jan. 14, 1970, abandoned. This application Dec. 23, 1971, Ser. No. 211,804

Int. Cl. B29c *24/00*; B29f *3/00*

U.S. Cl. 425—325 3 Claims



Siding formed of thermoplastic resin material and characterized by an embossed grain texture, and by low light reflection and high impact strength. Method and apparatus are provided incorporating various steps and devices for imparting a grain texture by embossing and for reducing the gloss and increasing the impact strength, notwithstanding the embossing.

3,825,391

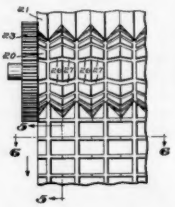
DIE FOR EXTRUSION OF LATTICE STRUCTURES

Richard P. Davis, Sanbornton, N.H. 03269

Continuation of Ser. No. 115,405, Feb. 16, 1971, abandoned. This application Feb. 28, 1973, Ser. No. 336,613

Int. Cl. B29c *15/00*

U.S. Cl. 425—362 6 Claims



A die for extruding three dimensional lattice materials utilizing a roll of sawtooth configuration in its longitudinal direction, with grooves disposed in a pattern on the surfaces of the teeth. In one form of the die, the roll mates with a set of stationary teeth which closely engage the surfaces of the roll teeth so that material is extruded only when the grooves come into register with the stationary teeth. The bottom surfaces of the stationary teeth are flat, and are slightly spaced from a cylindrical roll. The resulting extrusion is a continuous solid sheet with an open three dimensional lattice structure on its upper surface. In another form of the die, the roll mates with a lower roll of similar configuration with another pattern of grooves on the surfaces of its teeth. The resulting extrusion is an entirely open three dimensional lattice.

3,825,392

APPARATUS FOR FORMING PIPE COUPLING

Elmer R. Ligon, and Norman D. Reed, both of Pittsburgh, Kans., assignors to W. S. Dickey Clay Manufacturing Company, Pittsburgh, Pa.

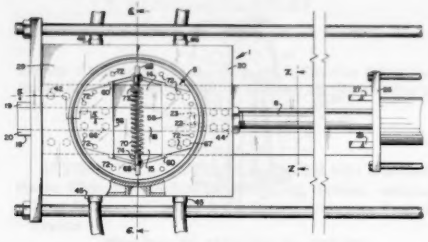
Filed Aug. 14, 1972, Ser. No. 280,341

Int. Cl. B29c *17/00*; B29d *23/03*

U.S. Cl. 425—387 R 9 Claims

An apparatus and method for molding a pipe coupling from tubular blanks or members of suitable synthetic resin wherein the apparatus comprises an outer jacket mounted on a sup-

porting frame and an inner mold member positioned within the outer jacket and having a plurality of sections each having an outer surface selectively movable toward and away from an inner surface of the outer jacket in response to operation of an extensible member. The outer jacket and each of the sections of the inner mold member have means for communicating a temperature controlling material into same. The molding



method is to heat a tubular member, insert same into the molding apparatus and move the parts to form the member to form the coupling which is then cooled to harden same and removed from the mold. When the resin member is in elongate form or pipe a cutting blade is mounted on the supporting frame and engageable with the tubular portion at a position to sever a molded pipe coupling of a desired length from the pipe section.

3,825,393

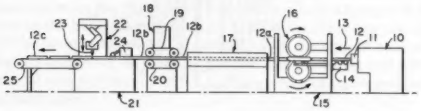
APPARATUS FOR MANUFACTURING A FLUID DISPENSING NIPPLE CONSTRUCTION

Charles W. Bittner, and George F. Rexon, both of Box 149, Haddonfield, N.J. 08033

Division of Ser. No. 235,748, March 17, 1972, abandoned. This application May 25, 1973, Ser. No. 363,972

Int. Cl. B29c *3/02, 17/02*

U.S. Cl. 425—392 **6 Claims**



A manufacturing apparatus wherein a conveyor longitudinally conveys tubing in a plastic state, a crimping means being located along the path of tubing movement for intermittent crimping of the tubing, and curing means along the path downstream of the crimping means.

3,825,394

INSTALLATION FOR THE MANUFACTURE OF FINISHED CONCRETE COMPONENTS

Fritz Pietrowiak, 800 Munich 60, Germany

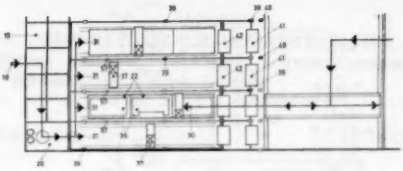
Filed Jan. 4, 1973, Ser. No. 320,940

Claims priority, application Germany, Nov. 24, 1972, 2257768

Int. Cl. B28b *7/00*

U.S. Cl. 425—404 **15 Claims**

Installation for the manufacture of finished concrete components including a transfer crane system interconnecting a plurality of operative work stations in a predetermined work flow path traversed by transport wagons; said work stations being adapted to provide in sequence, the forming of a concrete pouring mold, positioning the mold on a wagon, forming reinforcing elements for the concrete, insertion of the elements into the mold, pouring and vibrating the concrete



into the mold, hardening the concrete, and finishing the concrete in a continuous operative work pattern.

3,825,395

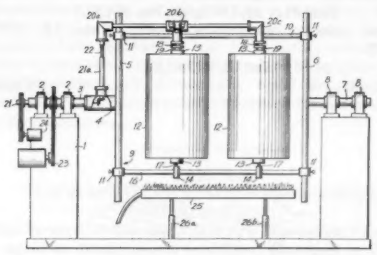
APPARATUS FOR MOLDING HOLLOW PLASTIC ARTICLES

Stewart Pivar, Muttontown, Long Island, N.Y., assignor to Rototron Corporation, Farmingdale, N.Y.

Continuation of Ser. Nos. 103,893, Jan. 4, 1971, Pat. No. 3,676,037, and Ser. No. 724,803, April 29, 1968, abandoned. This application May 25, 1972, Ser. No. 256,695The portion of the term of this patent subsequent to July 11, 1989, has been disclaimed.

Int. Cl. B29c *5/04*

U.S. Cl. 425—435 **1 Claim**



Apparatus for molding hollow plastic articles in which a mold is simultaneously rotated about two mutually perpendicular axes, a source of heat being located at a position generally radially displaced relative to a circle described by the mold. The mold is supported in a frame which is of adjustable size, there being provided a telescopic drive for rotating the mold and which is extensible to accommodate adjustments in the frame.

3,825,396

BLOW MOLD LATCHING MECHANISM INCLUDING A SAFETY FEATURE

Robert F. Kontz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

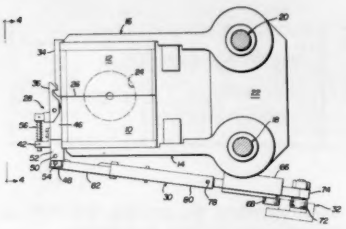
Filed Mar. 7, 1973, Ser. No. 338,899

Int. Cl. B29c *1/16*

U.S. Cl. 425—450 C **7 Claims**

A mechanism for latching together the mold halves of a blow molding machine at their parting line includes a safety feature which prevents application of the latching force to the mold halves if a foreign object prevents closing of the molds. The latch actuating system is particularly adapted for use in a blowing operation wherein the mold halves swing toward and away from each other and reciprocate along axes parallel with

the parison. The actuator comprises an elongated cam positioned to be engaged during the blowing cycle by a cam follower mounted on a latch actuating arm carried by one of the mold halves.



3,825,397

CONTROL AND SECURITY DEVICE FOR BURNERS

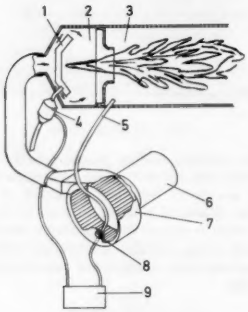
Sture Ragnar Johansson, Varberg, and Hilding Ake Gerry Carlsson, Skallinge, both of Sweden, assignors to Monark-Crescent AB, Varberg, Sweden

Filed May 21, 1973, Ser. No. 361,963

Claims priority, application Sweden, June 15, 1972, 7869/72

Int. Cl. F23n *5/08*

U.S. Cl. 431—79 **4 Claims**



A burner for a car heater comprises an impeller for the supply of combustion air, and further, measuring means for controlling the supply of fuel. The impeller is inserted between the flame developed in said burner and a signal detector. This detector receives light pulses of different frequencies from the flame through the rotating impeller different with the frequency depending upon the different rotational speeds of the impeller. These frequencies are transformed into signals, which are supplied to the measuring means for controlling the fuel supply to the burner in relation to the quantity of combustion air supplied. This means also that the supply of fuel is shut off if the rotation of the impeller stops or if the flame goes out.

3,825,398

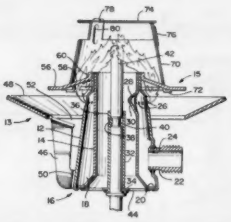
PLURAL RATE BURNER WITH FLAME ENHANCEMENT

Jay R. Katchka, Cypress; Fred W. Hendrick, and Michael E. Egger, both of Long Beach, all of Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed June 15, 1973, Ser. No. 370,494

Int. Cl. F23n *5/10*

U.S. Cl. 431—80 **8 Claims**



A burner produces an outward extending flame at a high rate and an upward extending flame at a low rate. Facilities are provided for enhancing the entrainment of air in both the outward extending flame and the upward extending flame.

3,825,399

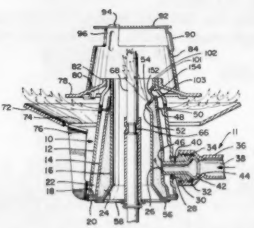
CONVERTIBLE BURNER WITH HEATING OF FLAME SENSING ELEMENT

Theodore J. Dykzeul, Los Angeles, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed June 18, 1973, Ser. No. 371,017

Int. Cl. F23n *5/10*

U.S. Cl. 431—80 **6 Claims**



A burner convertible for use with different fuels has a flame sensing element with burner ports from different fuel chambers directed toward the flame sensing element.

3,825,400

GAS FUEL BLOWPIPE FOR BURNING REACTION GAS MIXTURES

Vitaly Fedorovich Popov, ulitsa Gogolya 4, kv. 13, Severodonetsk Voroshilovgradskoi oblasti, U.S.S.R.

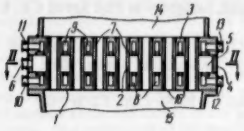
Filed Apr. 17, 1973, Ser. No. 352,029

Int. Cl. F23d *15/04*

U.S. Cl. 431—160 **2 Claims**

A blowpipe for burning reaction gas mixtures separating in reactors and furnaces the fuel gas area from the burning area, comprises a burner and a partition installed in parallel to each other and interconnected by a shell forming therebetween a chamber for the oxidiser. The distribution tubes with the burning area, with some of the ends of the distribution tubes being fastened hermetically to the partition, and the other ends are located in the channels of the burner along the fit ensuring under the operating conditions their axial movement and heat

transfer to the burner. Formed on the walls of distribution tubes are slots serving to supply the oxidiser from the chamber



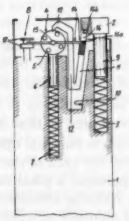
for the oxidiser to the burning area. Cavities for a cooling liquid or refrigerant are formed in the burner and the partition.

3,825,401

AUTOMATIC CIGARETTE LIGHTER MECHANISM

Pierre Chevallier, Sainte-Foy-Les-Lyon, France, assignor to Establissements Genoud & Cie Societe Anonyme, Venissieux, France

Filed Dec. 21, 1972, Ser. No. 317,255
Claims priority, application France, Jan. 6, 1972, 72.00867
Int. Cl. F23q 1/02
U.S. Cl. 431—274 **2 Claims**



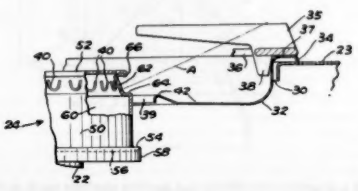
In an automatic cigarette-lighter mechanism, the spring-urged control key of the push-button type has a V-shaped extension, one branch of the V being attached to the control key and the other forming the pawl for driving the ratchet associated with the flint wheel. Possibly, a notch is formed in the key at the beginning of said one branch for receiving one end of the lever controlling the burner valve, notably in case of a lighter operating on gaseous fuel, so that the upper and lower end of said notch control the opening and closing respectively of said valve.

3,825,402

GAS BURNER

Donald E. Duperow, and William J. Ferlin, both of Detroit, Mich., assignors to Lincoln Brass Works, Inc., Detroit, Mich.

Filed Nov. 16, 1972, Ser. No. 307,078
Int. Cl. B05b 1/14
U.S. Cl. 239—568 **13 Claims**



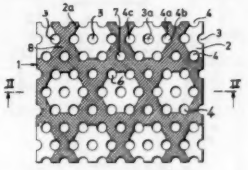
Closed-center inverted cup type gas burner has noncircular, nonlinear slot-shaped burner ports with uniform widths, the port axes being angled upwardly to clear the top of a surrounding aeration pan. The fuel valve orifice is metered to inject gas into the mixing tube at velocities inverse to the flow rate to the burner.

3,825,403

BURNER PLATE FOR INFRARED RADIATOR

Herbert Gottschall, Leichlingen, Germany, assignor to Schwank GmbH, Cologne, Germany

Filed Dec. 20, 1972, Ser. No. 316,671
Int. Cl. B28b 1/48
U.S. Cl. 431—328 **16 Claims**



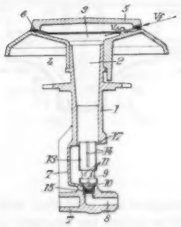
A burner plate which comprises depressions on the radiating side and combustion passages arranged parallel to each other for conveying the fuel-air mixture from the mixture side to the radiating side of the plate, in which at least one of the combustion passages is coaxially arranged at the bottom of the respective pertaining depression whereas the other combustion passages are distributed over the sides of the depressions and the plate surface between the sides of the depressions, the combustion passages being distributed over the depressions and the radiating surface in such a way that the flames being generated will so uniformly act upon the lateral surface of the depressions and the radiating surface of the plate therebetween that the temperature being generated in the depressions will substantially equal the temperature generated at the radiating surface between the lateral surfaces of the depressions.

3,825,404

GAS BURNERS, ESPECIALLY FOR DOMESTIC APPLIANCES

Jean Bernard De Gouville, Veigne Pres Montbazon, France, assignor to Establissments Sourdillon, Matricage et Robinetberie de Precision, Veigne pres Montbazon, France

Filed Apr. 14, 1972, Ser. No. 244,042
Int. Cl. F23d 13/40
U.S. Cl. 431—354 **12 Claims**



The burner is supplied from at least one injector in which to ensure the correct air/gas mixture for the various flow-rates of gas, the injector delivering into at least two successive chambers. One chamber receives the gas at the outlet from the injector and is relatively small so that even at very small flow-rates the proportionality of the air/gas mixture is substantially maintained. This one chamber delivers into the following

chamber, which is provided with narrow longitudinal slots for introducing additional air suitable for the largest flow-rates.

3,825,405

TEMPERATURE CONTROL SYSTEM FOR ROTARY KILNS

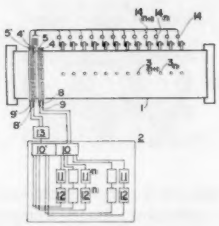
Yoshizo Suga, Yokohama, Japan, assignor to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 2, 1973, Ser. No. 412,478

Claims priority, application Japan, Nov. 20, 1972, 47-115700

Int. Cl. F27b 7/36; G05d 23/00

U.S. Cl. 432—36 **6 Claims**



In a rotary kiln of the type having a plurality of temperature control units, each control unit being adapted to control the opening of the damper for a shell fan in accordance with the output signal of a thermocouple, a temperature control system whereby one of a plurality of control elements constituting a stationary controller is coupled to the corresponding one of the temperature control units at a selected rotational angular position of the kiln to effect the desired temperature control, thereby sequentially selecting and actuating the temperature control units in accordance with the rotation of the kiln to control the distribution of temperature within the kiln.

3,825,406

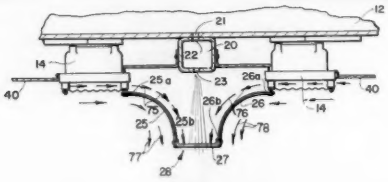
RADIATION-CONVECTION HEATING SYSTEM

George E. Heath, Lyndhurst, Ohio, assignor to Infra-Ray Division Solaronics, Inc., Cleveland, Ohio

Filed Aug. 24, 1972, Ser. No. 283,512

Int. Cl. F23d 23/00

U.S. Cl. 432—175 **23 Claims**



Radiant heat sources are provided with aspiration devices for inducing air flow across the sources and directing it along paths paralleling the emission of radiant heat energy toward objects being heated. The heat sources are preferably arranged in pairs with an apertured compressed air header positioned between the sources of each pair to induce opposed air flow currents across the sources. Air deflector plates cooperate with the compressed air header to form an aspiration device which diverts the opposed air flow currents into a common flow of heated air directed toward the objects being radiantly heated by the sources.

3,825,407

HEATER HOLDING BRACKET FOR A HEAT FIXER IN A COPYING MACHINE OR THE LIKE

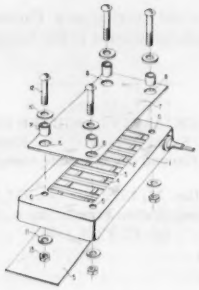
Yasuhiro Fujite; Hitoshi Fujiwara, and Mitio Yamasawa, all of Yamasawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1972, Ser. No. 319,063

Claims priority, application Japan, Dec. 27, 1971, 46-122575

Int. Cl. H05b 1/00; F27b 9/00

U.S. Cl. 432—227 **7 Claims**



Heating apparatus comprising at least one heating element for radiating heat to a material to be heated, bracket means for supporting the heating elements, the bracket means comprising a sufficiently large opening in the side thereof away from the material to be heated so that the amount of deformation of the bracket means is minimal upon heating by the heating element, the ratio of the area of the opening to the area of the side being 60–80 percent, a plate disposed over the opening and adjacent the heating element for reflecting radiant heat from the heating element to expedite the heating of the material to be heated and to lessen the amount of power consumed by the heating element, and means for loosely connecting the plate to the bracket means so that, upon heating by the heating element, the plate deforms independently of the bracket in spite of it being disposed adjacent the heating element.

3,825,408

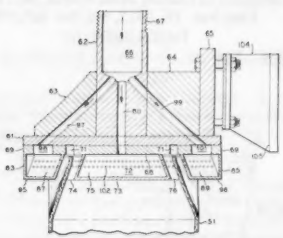
HOT AIR HEATER FOR CARTON SEALING MACHINE

Silvio T. Farfaglia, Fulton, and Robert G. Halpin, Minetto, both of N.Y., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 7, 1973, Ser. No. 395,024

Int. Cl. F23d 3/00

U.S. Cl. 432—230 **10 Claims**



In a machine for filling and sealing cartons such as the thermo-plastic coated paperboard milk cartons, the heater head for heating the upper portion of the carton prior to sealing comprises a first hot air plenum chamber which enters the

open end of the carton and has a continuous outer perforated wall facing the inner surface of the carton and a second hot air plenum chamber which surrounds the outside of the upper end of the carton and has a continuous inner perforated wall facing the outside surface of the carton. The outer wall of the first plenum chamber and the inner wall of the second plenum chamber form a continuous annular space for receiving the top marginal portion of a carton, with the perforations in both walls being spaced to provide heating of both the inner surface and the outer surface of the full extent of the top marginal portion of the carton. The outer wall of the first plenum chamber and the inner wall of the outer plenum chamber extend downwardly and outwardly away from the central vertical axis of the carton while the inner wall of the second plenum chamber extends downwardly and outwardly with respect to the central vertical axis of the carton.

3,825,409

PANELIZED SUSPENDED FURNACE ROOF AND IMPROVED FEED HOLE

Levi S. Longenecker, 61 Mayfair Dr., Pittsburgh, Pa. 15228

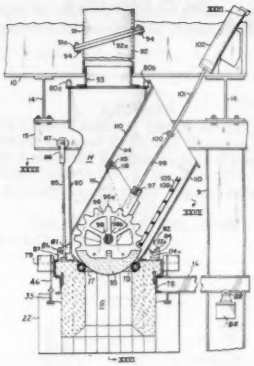
Filed Aug. 2, 1973, Ser. No. 385,083

Int. Cl. F23m *7/00*

U.S. Cl. 432—250 **27 Claims**

A suspended furnace roof is disclosed having an overhead metal framework involving spaced-apart crossextending girders and longitudinally extending spaced-apart beams that are adapted to extend between the girders and to be adjustably positioned in the spacing therebetween. A basically three-part hanger assembly is detachably suspended from the beam members and projects downwardly therefrom to detachably carry refractory tile members that may be assembled and shipped as a palletized group and, as such a group, mounted on such a hanger assembly at the construction site and while carried thereby, moved into a mounted position on an associated beam to close-off a portion of the furnace roof. A tertiary or uppermost hanger part of each assembly has a transverse yoke-like arm that at each of its ends has a flanged member from which opposed rows of secondary hanger parts are suspended to carry tile-suspending primary hanger parts.

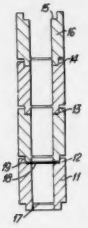
For feeding charging materials, the furnace roof may have at least one feed hole construction. This construction is shown as a pivotally and removably mounted feed and closure door



and sealing ring assembly, and as employed with an assembly of feed hole defining refractory blocks that are independently carried by a unitary metal frame. The block assembly is constructed to be moved as a truck unit on the unitary frame to one side of the furnace roof to facilitate construction, maintenance and repair work.

CHEMICAL

3,825,410
PERFORMANCE OF ROUTINE CHEMICAL REACTIONS IN COMPARTMENTALIZED CONTAINERS
Kenneth Dawson Bagshawe, 115 George St. Marble Arch, London W 1, England
Filed May 13, 1971, Ser. No. 143,134
Claims priority, application Great Britain, Dec. 29, 1970, 61627/70; May 13, 1970, 23262/70
Int. Cl. G01n *33/16*
U.S. Cl. 23—230 R **25 Claims**



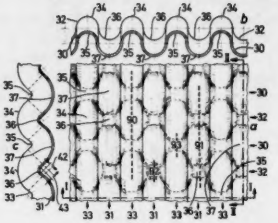
In the performance of routine chemical and/or biological reactions, such as saturation analysis using a radioactive marker substance, the standard reactants are dispensed in appropriate amounts, in a prior operation, into a compartmentalized storage container which also constitutes the reaction vessel, the reactants being maintained in a stable unreactive state, such as by freeze drying, until the analysis is to be performed. The reaction is initiated by introduction of a sample to be analysed, whereafter separation of bound and free ligand can be performed either within the compartmentalized vessel itself or externally.

3,825,411
REAGENT AND METHOD FOR BILIRUBIN DETERMINATION
Leo G. Morin, Miami, Fla., assignor to Medico Electronic, Inc., Indianapolis, Ind.
Filed Aug. 30, 1972, Ser. No. 284,883
Int. Cl. G01n *33/16*
U.S. Cl. 23—230 B **14 Claims**

A reagent and method for the determination of total serum bilirubin by coupling of bilirubin with a stable diazonium salt, Fast Red PDC or diazotate-N'-butyl-4-methoxy-metanilamide, at an acid pH is disclosed.

3,825,412
PRODUCTION OF PIPE BEND SHEATHS
Gernot F. Mullender, S. Chone Aussicht 28, 6331 Stockhausen, Germany
Filed Feb. 9, 1972, Ser. No. 224,736
Claims priority, application Germany, Feb. 15, 1971, 2107068
Int. Cl. B32b *15/00*
U.S. Cl. 29—180 SS **4 Claims**

A corrugated plastic or metal foil sheet, for use as an intermediate product in the production of pipe bend sheaths, is longitudinally and transversely arcuately corrugated so that it can be cut longitudinally and transversely into pieces each of

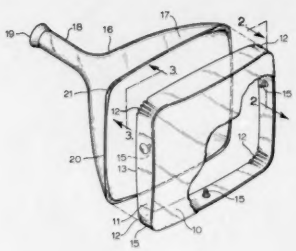


which constitutes a sheath in opened shape which can be turned into closed pipe bend shape.

ERRATUM

For Class 29—190 see:
Patent No. 3,824,664

3,825,413
METHOD OF FORMING SHEET GLASS COLOR TUBE FACE PANEL WITH PLEATED SKIRT
James W. Schwartz, Glenview, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.
Filed Feb. 16, 1973, Ser. No. 226,880
Int. Cl. C03b *23/02*
U.S. Cl. 65—61 **4 Claims**



A color television picture tube panel is fabricated of relatively thin sheet glass formed to define a substantially rectangular faceplate area surrounded by an upstanding flange having a fluted configuration over portions of its periphery. The end surface of the flange defines a seal edge for forming a glass-to-glass seal with a funnel having a seal edge of sufficient area to bridge the maximum peak to trough dimensions of the fluted portions. Methods of manufacturing such a panel are also described.

3,825,414

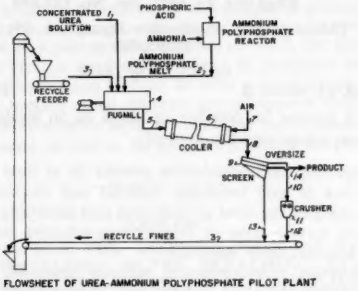
UREA-AMMONIUM POLYPHOSPHATE PRODUCTION

Robert G. Lee, Florence, and Robert D. Mitchell, Sheffield, both of Ala., assignors to Tennesse Valley Authority, Muscle Shoals, Ala.

Continuation-in-part of Ser. No. 202,836, Nov. 29, 1971, abandoned, which is a continuation-in-part of Ser. No. 130,236, April 1, 1971. This application Dec. 10, 1973, Ser. No. 423,419

Int. Cl. C05b *1/00*

U.S. Cl. 71—29 1 Claim



FLOWSHEET OF UREA-AMMONIUM POLYPHOSPHATE PILOT PLANT

Pugmill granulation process for the production of fertilizers containing urea and ammonium polyphosphate. Concentrated urea solution is sprayed onto recycled solids in the pugmill followed by molten ammonium polyphosphate. The melt is fed to the pugmill at a minimum of 12 inches downstream from the urea to prevent hydrolysis of the urea which results in foaming and gas evolution. The product from the pugmill is essentially anhydrous, and no further drying is required. Other fertilizer materials such as ammonium sulfate, potassium chloride, or micronutrient sources may be incorporated by adding them to the pugmill during granulation.

3,825,415

METHOD AND APPARATUS FOR THE PRODUCTION OF LIQUID TITANIUM FROM THE REACTION OF VAPORIZED TITANIUM TETRACHLORIDE AND A REDUCING METAL

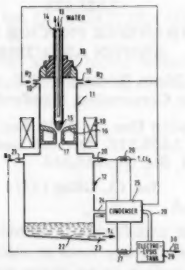
Philip Douglas Johnston; James Lawton, and Ian Mackison Parker, all of Chester, England, assignors to The Electricity Council, London, England

Filed July 21, 1972, Ser. No. 274,006

Claims priority, application Great Britain, July 28, 1971, 35535/71

Int. Cl. C22b *53/00*

U.S. Cl. 75—84.5 17 Claims



Elemental titanium is produced by reducing titanium tetrachloride using an alkali or alkaline earth metal, preferably sodium. The reaction is carried out in the vapour phase, a carrier gas, preferably hydrogen, being heated by an electric arc and injected into the reaction chamber to heat the sodium and titanium tetrachloride which are injected as liquids or vapours. The reaction is carried out at a temperature above the melting point of titanium, typically between 1,800° and 2,500°C, the titanium falling as a liquid to the bottom of the reaction chamber and the chloride of the reducing metal and other unwanted products being removed in vapour form. The chloride of the reducing metal is passed through a heat exchanger for heating material passing into the chamber and is electrolysed to provide the required alkali or alkaline earth metal.

3,825,416

SELF-LUBRICATING IRON BASE ALLOY

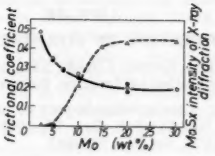
Yoshiyuki Mizutani and Katutoshi Tozawa, Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho

Filed July 10, 1972, Ser. No. 270,398

Claims priority, application Japan, July 9, 1971, 46/51,259

Int. Cl. C22c *37/00, 39/00*

U.S. Cl. 75—123 AA 3 Claims



A self-lubricating iron base alloy contains a total of from 5 to 30% of one or more metals selected from the group consisting of Ti, Zr, V, Nb, Ta, Mo and W, and 0.5 to 5% of either sulphur or selenium, the balance being essentially iron, and all contents being in weight percent. The alloy is abrasion resistant and can be used over a wide range of temperatures.

3,825,417

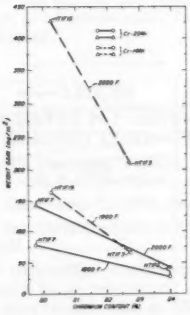
AUSTENITIC STAINLESS STEEL

Thomas M. Costello and Jerome P. Bressanelli, Pittsburgh, Pa., assignors to Crucible Inc., Pittsburgh, Pa.

Filed Apr. 21, 1972, Ser. No. 246,342

Int. Cl. C22c *39/20*

U.S. Cl. 75—128 A 2 Claims



An austenitic stainless steel consisting essentially of, in weight percent, .20 max. carbon, 8 max. manganese, 1 to

4 silicon, 20 to 30 chromium, 6 to 18 nickel, .50 max. nitrogen, up to .02 boron, at least 0.03% of a strengthening element selected from the group consisting of columbium, zirconium and titanium each in an amount from 0 to .3% and the balance iron.

3,825,418

ALLOYS FOR ISOLATION OF HYDROGEN

James J. Reilly, Bellport, and Richard H. Wiswall, Jr., Brookhaven, N.Y., assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Jan. 30, 1973, Ser. No. 327,897

Int. Cl. C22c *9/06, 19/00*

U.S. Cl. 75—159 **4 Claims**

A group of alloys capable of reversible absorption of hydrogen in the presence of CO and CO_2 having the chemical formula of $LaNi_xCu_{5-x}$ where x is any number from above zero to less than five. Also disclosed are alloys of mischmetal with either nickel or copper. The hydrides are also described.

3,825,419

BENEFICIATION OF TITANIFEROUS ORES

James H. Chen, Corpus Christi, Tex., assignor to Benilite Corporation of America, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 866,548, Oct. 15, 1969. This application July 19, 1971, Ser. No. 163,805

Int. Cl. C01g *23/04;* **C02b** *3/00*

U.S. Cl. 75—101 **6 Claims**

During the beneficiation of titaniferous iron ores by leaching thereof in a vessel with about 20% liquid hydrochloric acid, the required heat is supplied by introducing about 20% hydrochloric acid vapor into the vessel as the sole heat exchange medium.

3,825,420

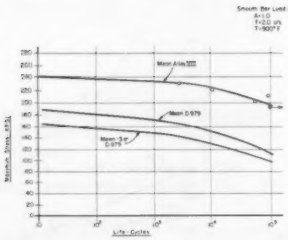
WROUGHT SUPERALLOYS

Bruce A. Ewing and Frank J. Rizzo, Jr., Shelton, Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Aug. 21, 1972, Ser. No. 282,510

Int. Cl. C22c *19/00*

U.S. Cl. 75—171 **9 Claims**



Wrought superalloy compositions possessing high strength, corrosion resistance and utility at moderate temperatures are produced by atomizing a melt of the desired composition and thereafter consolidating the powders by extrusion and pressforging.

3,825,421

PROCESS FOR FORMING AN IMAGE ON INSULATIVE MATERIALS

Yasuo Tamai, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 29, 1971, Ser. No. 193,890

Claims priority, application Japan, Oct. 29, 1970, 45/95,488

Int. Cl. G03g *13/22*

U.S. Cl. 96—1 R **14 Claims**

A process for forming an image on an insulative material comprising the steps of:

dispersing electroconductive powder on at least one surface of said insulative material and electrostatically charging the same no later than said dispersing to thereby form a layer of said electroconductive powder on said insulative material;

dispersing photoconductive particles onto said layer of electroconductive powder and electrostatically charging the same no later than said dispersing to thereby form a layer of said photoconductive powder on said layer of electroconductive powder;

subjecting the thus formed layer of photoconductive particles to imagewise exposure of the original image;

removing said photoconductive particles in the exposed areas; and

fixing the remaining photoconductive particles to thereby obtain an image on the surface of said insulative material.

3,825,422

IMAGING PROCESS

Robert J. Gruber and Bernard Grushkin, Pittsford, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 26, 1972, Ser. No. 300,958

Int. Cl. G03c *5/06*

U.S. Cl. 96—1 PE **8 Claims**

Vanadyl and titanyl phthalocyanine compounds as electrically photosensitive pigments in photoelectrophoretic imaging.

3,825,423

IMAGE TRANSFER PROCESS AND ALSO KNOWN AS D/2888

Elsie L. Menz, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Original application Dec. 24, 1969, Ser. No. 887,805, now Patent No. 3,658,519. Divided and this application Dec. 20, 1971, Ser. No. 210,284

Int. Cl. G03g *13/14*

U.S. Cl. 96—1.4 **16 Claims**

A method of transferring dielectric imaging material containing a static charge from an electrically conductive image bearing surface to an image receiving surface by means of coulombic attraction and the rearrangement of electrical charges.

3,825,424

PROCESS FOR TRANSPARENT PHOTOGRAPHIC IMAGES

Robert F. Gracia, Scituate, Richard A. Laughrey, Woburn, and Paul F. Tuohey, Quincy, Mass., assignors to Itek Corporation, Lexington, Mass.

No Drawing. Application Oct. 1, 1969, Ser. No. 862,912, which is a continuation-in-part of application Ser. No. 744,631, July 15, 1968, both now abandoned. Divided and this application Aug. 7, 1972, Ser. No. 278,310

Int. Cl. G03c *5/24*

U.S. Cl. 96—48 PD **21 Claims**

This invention is concerned with a process of producing photographic images on a transparent substrate by photoexposure of a photographic medium of which the photosensitive layer is removable followed by prolonged treatment of the exposed medium to form a metal image adherently bonded to the substrate and subsequent removal of the photosensitive layer to obtain the metal image on the substrate, as well as the products produced thereby.

3,825,425

PROCESS FOR THE REGENERATION OF USED PHOTOGRAPHIC SILVER BLEACHING BATHS USING CHLOROUS ACID OR ITS WATER-SOLUBLE SALTS

Max Heilmann, Cologne, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Feb. 26, 1973, Ser. No. 335,597

Claims priority, application Germany, Mar. 2, 1972, P 22 09 959.8

Int. Cl. G03c *5/26, 5/32*

U.S. Cl. 96—60 R **11 Claims**

A process for the regeneration of used photographic silver bleaching baths containing the iron-II-cyanide complex wherein the bath is treated with chlorous acid or a water soluble salt thereof at a pH of 5 to 8 optionally in the presence of a catalyst as herein defined.

3,825,426

DEVELOPMENT OF EXPOSED PHOTOGRAPHIC SILVER HALIDE ELEMENTS

Robert Joseph Pollett, Vremde, Herman Adelbert Philippaerts, Edegem, Antoon Leon Vandenberghe, Hove, and Jozef Frans Willems, Wilrijk, Belgium, assignors to AGFA-Gevaert N.V., Mortsel, Belgium

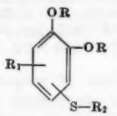
No Drawing. Filed Nov. 3, 1972, Ser. No. 303,404

Claims priority, application Great Britain, Nov. 10, 1971, 52,290/71

Int. Cl. G03c *1/34, 1/78*

U.S. Cl. 96—76 R **8 Claims**

A photographic silver halide emulsion is described which comprises a compound of the formula:



wherein:

R is hydrogen, acyl, haloacyl or acyl carrying a quaternary ammonium group,

R_1 is hydrogen, alkyl, aryl, halogen or alkoxy, and

R_2 is an aliphatic, aromatic or heterocyclic group.

The compounds are especially useful in Lippmann-emulsions to reduce distortions of image details, to enhance image sharpness and to reduce yellow staining upon reversal development.

3,825,427

RECORDING MEMBER OF PHOTOCOLOR DEVELOPING AND ELIMINATING MATERIAL AND THE RECORDING METHOD

Eiichi Inoue, Isamu Shimizu, Hajime Kobayashi, and Ichiro Endo, Tokyo, Japan, assignors to Canon Camera Kabushiki Kaisha, Tokyo, Japan

Application Feb. 15, 1968, Ser. No. 705,758, which is a continuation-in-part of application Ser. No. 630,519, Apr. 13, 1967, both now abandoned. Divided and this application June 14, 1971, Ser. No. 153,037

Claims priority, application Japan, June 19, 1967, 42/39,203; Aug. 16, 1967, 42/52,859

Int. Cl. G03c *1/52*

U.S. Cl. 96—90 PC **5 Claims**

This invention provides a photocolor developing and eliminating composition, a recording member of monochrome or multicolor developing and eliminating composition, method for image forming, fixing, or restoring which is applicable to said recording members and usual recording members of photocolor developing and eliminating material, and method for projecting image on a screen of photocolor developing and eliminating material. A photocolor developing and eliminating composition comprises a photocolor developing and eliminating material and a stabilizer, which is either electron or proton donating or accepting material or solid matter, on which surface said material being dispersed and which inherently possesses acidic, basic, ionic, electric charge transferring or high surface energy property at the surface, and the stabilizer stabilizing the color-developed state continuously, restoring after fixing the color-developed state to the colorless state by the stimulus of radiation having another range of wave length and reproducing a stable color-development. The multicolor developing and eliminating composition comprises a film matter prepared by incorporating a photocolor developing and eliminating material to a transparent or translucent dispersion medium or the film attaching to a support such as paper and the like, and the recording member is wholly color-developed by irradiating it by a radiation having at least one range of wave-length such as light, heat and the like. Particularly, at least one dispersion medium is used to cover the whole visible light range in the colored state. And the color image recording method is very useful for the rapid, simple and much memorizing and recording in information industry such as communication, measurement documentation and display.

3,825,428

UNSATURATED POLYESTER RESIN PHOTORESIST COMPOSITION

Edmund Benjamin Davidson, Yardley, Pa., assignor to RCA Corporation

No Drawing. Filed Aug. 7, 1972, Ser. No. 278,263

Int. Cl. G03c *1/68, 1/70*

U.S. Cl. 96—91 N **5 Claims**

A photoresist composition comprising an unsaturated polyester resin such as an unsaturated alkyd resin polymer which has been reacted with an alkoxysilane and a free radical initiator, to increase its speed of response. A sensitizer is also preferably included in the composition.

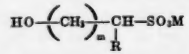
3,825,429

FOGGED DIRECT-POSITIVE SILVER HALIDE EMULSION CONTAINING AS STABILIZER A BISULFITE ADDITION PRODUCT OF AN ALDEHYDE

Tetsuo Furuya, Minami-Ashigara, Yoshio Ibe and Hideo Kanisawa, Odawara, and Osakazu Sugino, Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

No Drawing. Filed Dec. 6, 1972, Ser. No. 312,493
Int. Cl. G03c 1/28, 1/34
U.S. Cl. 96—108 5 Claims

A direct positive light-sensitive silver halide photographic material is stabilized for storage by incorporating therein a polyamine, a salt of a metal more electropositive than silver and a compound of the formula



wherein m is 0 or an integer of 1 to 8, R is a hydrogen atom, or an alkyl group having up to 17 carbon atoms, or an aryl group and M is a cation.

3,825,430

LIGHT-SENSITIVE COMPOSITION AND METHOD

Kurt A. Kurka, Shoreview, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Filed Feb. 9, 1972, Ser. No. 224,930
Int. Cl. G03c 1/68
U.S. Cl. 96—115 R 14 Claims

Light-sensitive compositions are provided wherein a continuous phase comprises a light-sensitive organic material while a discontinuous phase comprises finely divided, rubbery, elastomeric, organic compound. The compositions can be cured to an insoluble, heat-resistant, flexible state. A method for covering or protecting printed circuitry using such compositions is also provided.

3,825,431

PRINT PASTES

Guenter Uhl, Worms, and Knut Oppenlaender, Rolf Fikentscher, and Richard Mueller, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengeselischaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Mar. 15, 1972, Ser. No. 234,991
Int. Cl. C09d 11/00, 11/02, 11/16
U.S. Cl. 106—20 6 Claims

Print pastes based on oil-in-water emulsions which contain esterification products of oxyalkylated alcohols as defoamers in addition to auxiliaries conventionally used in print pastes.

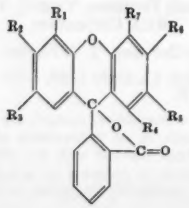
3,825,432

HEAT SENSITIVE RECORDING MATERIAL

Kiyoshi Futaki and Masaya Motoki, Kyoto, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

No Drawing. Filed Mar. 9, 1971, Ser. No. 122,521
Claims priority, application Japan, Mar. 10, 1970, 45/19,758
Int. Cl. C09d 11/00; C09k 3/00
U.S. Cl. 106—21 9 Claims

A heat sensitive recording material containing at least one of lactone compounds having the general formula,



(wherein R_2 is selected from the group consisting of hydrogen, a lower alkyl group of 1 to 5 carbon atoms, a lower alkoxy group of 1 to 5 carbon atoms, amino group, a lower alkyl amino group of 1 to 5 carbon atoms and benzyl amino group; R_1 and R_3 are selected from the group consisting of the same members as above defined on R_2 except that benzyl amino group is excluded; at least one of R_1 and R_2 are selected from amino group, a lower alkyl amino group of 1 to 5 carbon atoms and benzyl amino group; R_5 is selected from the group consisting of hydrogen, a lower alkyl group of 1 to 5 carbon atoms, a lower alkoxy group of 1 to 5 carbon atoms, halogenes, a lower alkyl amino group of 1 to 5 carbon atoms, benzyl amino group and aryl amino group; and R_4, R_6 and R_7 are selected from the group consisting of the same members as above defined on R_5 except that aryl amino group is excluded) and at least one phenol compounds.

3,825,433

HYDRAULIC BINDER

Alfred Schneider-Arnoldi, Krefeld, Hellmut Gäbler, Morlenbach, near Weinheim an der Bergstrasse, and Joachim Kandler, Lechenich, Germany, assignors to Knapsack Aktiengesellschaft, Knapsack, near Cologne, Germany

No Drawing. Continuation of abandoned application Ser. No. 711,875, Mar. 11, 1968. This application Dec. 30, 1970, Ser. No. 102,944
Claims priority, application Germany, Mar. 22, 1967, K 61,792
Int. Cl. C04b 7/02, 7/14
U.S. Cl. 106—89 2 Claims

Production of a cement-based hydraulic binder containing from 10 to 80% by weight, preferably from 15 to 70% by weight slag ground to cement fineness and originating from the electrothermal production of phosphorus, and use of the hydraulic binder for making massive concrete.

3,825,434

INTERNALLY COATED REACTION VESSEL AND PROCESS FOR COATING THE SAME

Alan R. Berens, Hudson, and Thomas R. Paxton, Akron, Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

No Drawing. Filed Oct. 27, 1972, Ser. No. 301,476
Int. Cl. B01j 1/20; B44d 1/14
U.S. Cl. 117—72 12 Claims

A reaction vessel having on the internal surfaces thereof an adhesive primer coating containing, for example, a phenolic resin, and an insolubilized hydrophilic film or coating over said primer coating containing, for example, a glyoxal cross-linked polyvinyl alcohol and the process for coating said internal surfaces whereby polymer build-up on said internal surfaces is substantially decreased.

3,825,435

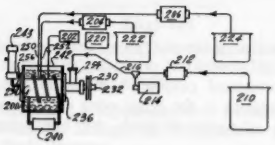
FLOCKING METHOD UTILIZING IN LINE MIXING OF ADHESIVE

Howard D. Hunt, Calhoun, Ga., assignor to Crown Crafts, Inc., Calhoun, Ga.

Filed Jan. 28, 1972, Ser. No. 221,607
Int. Cl. B05b 5/02, 7/26
U.S. Cl. 117—33 7 Claims

An improved method of preparing and directing a substrate material for electrostatic application of flocking members to an adhesive to produce a dense pile fabric such as a velvet fabric, a blanket fabric or a carpet fabric. A continuous substrate material is delivered from a roll around a heated drum to control moisture to an

adhesive applicator assembly which employs an improved system of delivering adhesive and controlling same on the substrate. The electrostatic grid system comprises high voltage (H.V.) plastic pipe electrodes arranged diagonally to the line of travel of the substrate and each pipe has an electrical conductor cable connected to it from a high voltage system. The diagonal arrangement of the grid system is within a grounded field of metal tubing which produces a weak electrostatic field above the H.V. electrodes and electrically removes any excess flocking material without damaging the flocking field.



The adhesive application rather than a solid film is a foam and the preparation of the adhesive rather than in large batch mixture is in small batches easily controlled as to delivery and formulation and mixing and foaming is in a foaming head and not in separate and additional operations. Chemical feed pumps and an adhesive feed pump deliver in a pre-controlled amount to a mixing and foaming head which is refrigerated and the adhesive mixture is filtered and delivered to the machine for application. The chemical pump is a Series 200 Chem-Tech International and the adhesive pump is a Moyno by Robbins and Meyers, Inc. A typical adhesive is "Rhoplex" E-358 from Rohm and Haas, Philadelphia, Pa.

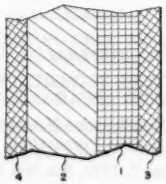
3,825,436

METHOD OF MAKING RARE EARTH OXYSULFIDE LUMINESCENT FILM

Robert A. Buchanan, Palo Alto, Ronald V. Alves, Saratoga, T. Grant Maple, Woodside, and Leon E. Sobon, Los Altos, Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Oct. 4, 1972, Ser. No. 294,902

Int. Cl. B44d *1/02;* **C03c** *3/28;* **H01j** *1/54*
U.S. Cl. 117—33.5 R **2 Claims**



This invention relates to high brightness, high contrast, high resolution rare earth crystalline luminescent films and processes for making such films. More particularly, the films are rare earth, crystalline oxysulfides of lanthanum, gadolinium, yttrium and lutetium activated with trivalent rare earth ions having atomic numbers from 59 through 70.

3,825,437

ADHESIVELY ERADICABLE TRANSFER MEDIUM

Samuel Darrell Blair, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

No Drawing. Filed Aug. 3, 1972, Ser. No. 277,543

Int. Cl. B41c *1/06*
U.S. Cl. 117—36.1 **4 Claims**

A transfer medium or typewriter ribbon is disclosed, which is capable of being utilized to imprint a letter and if the letter is erroneous, which is susceptible of adhesive removal. The ribbon is made of a hard, film forming resin with selective modification of its properties through the addition of additives which embrittle the film and make the resin more adherent for the imaging surface while not penetrating into the fibers of the paper imaging surface, and attaching itself. As time passes there is an increased attachment to the paper fibers thereby rendering a more permanent image. The ribbon is formed from a solvent blend of relatively high proportions of toluene and correspondingly reduced isopropanol.

3,825,438

MANUFACTURE OF PIGMENTS

David William Pritchard, Teesside, and Thomas James Wiseman, Richmond, England, assignors to British Titan Limited, Billingham, Teesside, England

No Drawing. Filed Apr. 25, 1972, Ser. No. 247,337

Claims priority, application Great Britain, Apr. 28, 1971, 11,824/71

Int. Cl. B44d *1/02*
U.S. Cl. 117—100 B **11 Claims**

A process for coating titanium dioxide pigment with at least one hydrous oxide of a metal by mixing an aqueous dispersion of the pigment with at least one water-soluble hydrolysable compound of a metal and precipitating a hydrous oxide on to the pigment in the presence of an alcohol and/or a carboxylic acid, each of which contains at least two or more hydroxy groups.

3,825,439

METHOD FOR FORMING AMORPHOUS SEMICONDUCTORS

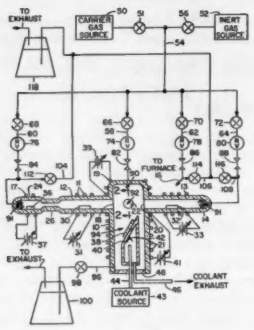
Paul A. Tick, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Aug. 16, 1972, Ser. No. 281,218

Int. Cl. C23c *11/08, 13/04*
U.S. Cl. 117—106 R **16 Claims**

A method of forming a chalcogenide glass film which contains at least one of the chalcogens sulfur, selenium, and tellurium and at least one of the Group IV A elements germanium and silicon. The Group IV A element is heated to a temperature sufficient to cause it to react with chalcogen vapors. A carrier gas passes over a first heated chalcogen source to provide a first gas mixture which passes over the surface of the Group IV A element to form a second gas mixture containing chalcogen vapors and vapors of the products of reaction of the first chalcogen and the Group IV A element. In a similar manner, vapors from other chalcogen sources and vapors from

other sources of amorphous semiconductor components can be obtained by carrier gas streams. All of the vapors which are to form the film are mixed and transported over the surface of a substrate the temperature of which is maintained between 160° C. and 250° C., which is sufficient to cause the formation of a continuous homogeneous film thereon. This method provides accurate composition control and composition variations throughout the film. A gas flow reversal technique provides accurate thickness control.



3,825,440

VAPOR DEPOSITION METHOD

Louis E. Branovich, Neptune, William B. P. Fitzpatrick, Wall, and Martin L. Long, Jr., West Belmar, N.J., assignors to the United States of America as represented by the Secretary of the Army

No Drawing. Continuation-in-part of application Ser. No. 159,067, July 1, 1971, which is a continuation-in-part of application Ser. No. 821,466, May 2, 1969, both now abandoned. This application Apr. 3, 1973, Ser. No. 347,600

Int. Cl. C23c *11/14*

U.S. Cl. 117—106 R **4 Claims**

Isotropic boron nitride is vapor deposited onto a substrate by suspending the substrate in a hot reaction chamber the inner walls of which bear a deposit of anisotropic boron nitride, and adding either water or ammonium hydroxide to the reaction chamber while the temperature of of the reaction chamber is maintained at about 850 degrees C. to about 1600 degrees C.

3,825,441

METHOD FOR IMPREGNATING CORRUGATED CARDBOARD, AND RESULTANT PRODUCT

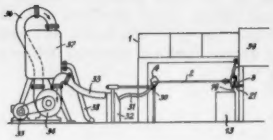
Werner Achermann and Franz Achermann, Zurich, Switzerland, assignors to Boise Cascade Corporation, Boise, Idaho

Original appplication Sept. 27, 1968, Ser. No. 763,268, now Patent No. 3,669,067. Divided and this application Mar. 3, 1972, Ser. No. 231,522

Int. Cl. B44d *1/02*

U.S. Cl. 117—119 **12 Claims**

Method for impregnating corrugated cardboard during the manufacturing process forming the said corrugated cardboard, and resultant product. A vacuum is formed within the corrugations of the cardboard and impregnating material is introduced into the corrugations under the influence of the said vacuum. The impregnating material is introduced under conditions which may be varied with respect to composition, temperature, viscosity and other variable process parameters. The apparatus of this invention includes a means for producing a suction on one edge of a corrugated cardboard while introducing impregnating material at the other edge of the corrugated cardboard as it passes through the impregnating apparatus.



3,825,442

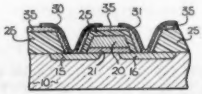
METHOD OF A SEMICONDUCTOR DEVICE WHEREIN FILM CRACKING IS PREVENTED BY FORMATION OF A GLASS LAYER

Gordon E. Moore, Los Altos Hills, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of abandoned application Ser. No. 4,841, Jan. 22, 1970. This application Sept. 27, 1972, Ser. No. 292,510

Int. Cl. H01l *7/34*

U.S. Cl. 117—212 **19 Claims**



In the manufacture of a semiconductor device wherein a film is to be formed over portions of a first layer having abrupt surface contours, the improvement of forming a glass layer, having a melting point lower than that of said first layer, on the first layer and heating sufficiently to cause a plastic flow of the glass layer at the abrupt contour to round the edges and avoid cracking of the subsequently established film.

3,825,443

COILED TUBE BLOWOUT PROCESS AND APPARATUS

Dennis E. Reilly, Bellefontaine Neighbors, Mo., assignor to Olin Corporation

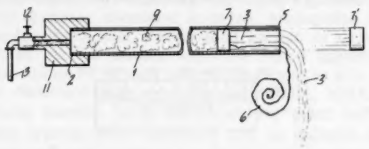
Filed June 7, 1972, Ser. No. 260,405

Int. Cl. B08b *9/00*

U.S. Cl. 134—24 **17 Claims**

A process and apparatus for removing the internal scarf from within a coil of welded tubing having a plurality of wraps which comprises filling the tubing with a substantially noncompressible liquid and applying a gas under pressure to force the liquid and scarf out of the

tubing. A plug is normally provided intermediate the gas and the liquid. The plug traverses the wraps of the tubing



to force the liquid and scarf out. A second plug may be provided at the outlet end of the tubing.

3,825,444

DEVICE FOR SEPARATING ELECTROLYTE CARRIED BY HYDROGEN DURING RECHARGING OF A STORAGE BATTERY

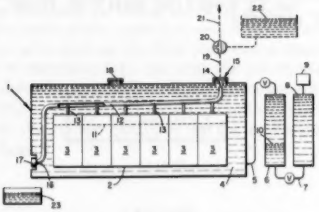
Gilbert Martin, La Seyne-sur-Mer, France, assignor to Etat Francais, Delegation Ministerielle pour l'Armement, Paris, France

Filed July 28, 1972, Ser. No. 275,894

Claims priority, application France, July 30, 1971, 7128007

Int. Cl. H01m *1/02*

U.S. Cl. 136—6 P **6 Claims**



Apparatus for separating the electrolyte carried by hydrogen during recharging of a storage battery housed in an oil filled box, including a collector tube connected to each storage cell and having an outlet in the upper part of the box and an outlet in the lower part, an oil tank having its upper part connected to the lower part of the oil filled box, a water tank having its lower part connected to the lower part of the oil tank and its upper part communicating with the external environment and a three-way valve which alternately connects the upper end of the collector tube to atmosphere or to a dielectric reservoir.

3,825,445

ELECTROCHEMICAL CELL WITH CATALYZED ACID PEROXIDE ELECTROLYTE

Richard W. MacCarthy, 35 Union Ave., Apt. 25, Campbell, Calif. 95008

No Drawing. Filed Mar. 19, 1973, Ser. No. 342,867

Int. Cl. H01m *27/00*

U.S. Cl. 136—83 R **14 Claims**

A high energy density electrochemical cell or fuel cell having an anode containing lithium, calcium magnesium, zinc, or aluminum with an acid electrolytic fuel containing a peroxide catalyzed by a salt of one or more metals selected from iron, cobalt, nickel, and copper. The rate of reaction may be moderated by concentration of salts of one or more metals high in the electromotive series or by a primary alcohol. A preferred cell comprises a carbon cathode, a magnesium anode, and an aqueous electrolyte containing, in moles per liter, about 4 hydrochloric acid, 0.6 hydrogen peroxide, 1.2 magnesium chloride, 0.02 ferric chloride, and 0.02 cupric chloride.

3,825,446

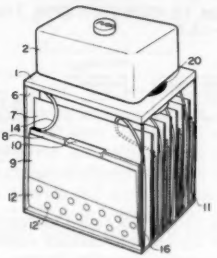
LEAD-ZINC PRIMARY BATTERY

Atsutaka Oka, Takatsuki, Japan, assignor to Yuasa Battery Company Limited, Takatsuki, Japan

Filed Nov. 10, 1972, Ser. No. 305,540

Int. Cl. H01m *17/00*

U.S. Cl. 136—114 **6 Claims**



A primary battery of lead-zinc type comprising a battery main body and a container jointed together, said battery main body consisting of a plurality of cells holding a lead positive plate and zinc negative plate supported by an electrode holder and a heating material, said container holding sulfuric acid and push rod therein and having a spout sealed with a membrane. When the container is pressed with hand from its outside, the lower edge of the push rod breaks the sealed membrane, allowing sulfuric acid to pour into the battery main body to activate the battery. The primary battery of lead-zinc type according to this invention has better performance at low temperatures and is simple to make and low in price.

3,825,447

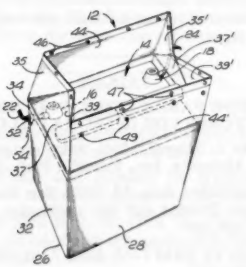
BATTERY COVER

Ralph Kraals, 551 Evergreen Drive, Pasadena, Calif. 91105

Filed July 17, 1972, Ser. No. 272,616

Int. Cl. H01m *1/02*

U.S. Cl. 136—166 **6 Claims**



A battery cover for preventing corrosive damage due to chemicals emanating from a battery. An enclosed

container is defined by side walls, a bottom wall and a top wall having closure means thereon. Openings in the container enable a cable to pass through the container and to electrically connect to the battery. Means are provided for tightly securing the container to the cables at the openings.

3,825,448

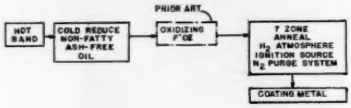
PRODUCTION OF DUCTILE HIGH STRENGTH GALVANIZED STEEL

John E. Hartmann, Canfield, and Alfred F. La Camera and Peter B. Lake, Youngstown, Ohio, assignors to Youngstown Sheet and Tube Company, Youngstown, Ohio

Filed Oct. 26, 1972, Ser. No. 301,126

Int. Cl. C23c *1/02, 1/04, 1/08*

U.S. Cl. 148—12.1 **7 Claims**



Advancing a strip of hot rolled low carbon steel, in the absence of an applied intermediate oxidizing treatment, through a continuous annnealing furnace as it is received from a cold reduction mill with a film of rolling oil, having preferred characteristics, on its surface; heating the strip to an annealing temperature in the range of 900–1100° F. strip temperature (1100–1300° F. furnace temperature) in a protective atmosphere which is preferably of high hydrogen; subsequently, coating the annealed strip with molten metal, preferably galvanizing material.

3,825,449

METHOD OF DEPOSITING EPITAXIAL LAYERS ON A SUBSTRATE FROM THE LIQUID PHASE

Donald Paul Marinelli, Trenton, N.J., and Thomas Edward Stockton, Cornwells Heights, Pa., assignors to RCA Corporation

Filed Aug. 31, 1973, Ser. No. 393,627

Int. Cl. H01l *7/38*

U.S. Cl. 148—172 **5 Claims**

The surface of the substrate on which the epitaxial layer is to be deposited is coated along at least one edge portion with a strip of a non-reactive material. An epitaxial layer is then deposited on the substrate by conventional liquid phase techniques by moving the substrate through a suitable deposition solution with the substrate preferably oriented so as to make the strip-coated edge the leading edge.

3,825,450

METHOD FOR FABRICATING POLYCRYSTALLINE STRUCTURES FOR INTEGRATED CIRCUITS

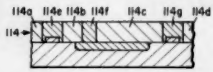
John A. Schoeff, Mesa, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Original application Aug. 10, 1970, Ser. No. 62,437, now abandoned. Divided and this application May 1, 1972, Ser. No. 249,403

Int. Cl. B44d *1/18;* **H01l** *7/36, 19/00*

U.S. Cl. 148—175 **1 Claim**

An improved integrated circuit structure is shown having an integral polycrystalline silicon member. The doping of such polycrystalline silicon member controls the usage of such member. When the poly silicon doping characteristics equal that of the layer of semiconductor material upon which it is deposited, it forms a good conductor and is usable as a contact. When the polycrystalline silicon doping characteristics are again the same as that of



the layer of semiconductor material upon which it is deposited but opposite that of the structure to be isolated, it forms a good isolation member. Various processes are shown for advantageously fashioning polycrystalline silicon structures.

3,825,451

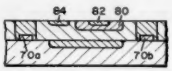
METHOD FOR FABRICATING POLYCRYSTALLINE STRUCTURES FOR INTEGRATED CIRCUITS

John A. Schoeff, Mesa, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Original application Aug. 10, 1970, Ser. No. 62,437, now abandoned. Divided and this application May 1, 1972, Ser. No. 249,404

Int. Cl. B44d *1/18;* **H01l** *7/36, 19/00*

U.S. Cl. 148—175 **1 Claim**



An improved integrated circuit structure is shown having an integral polycrystalline silicon member. The doping of such polycrystalline silicon member controls the usage of such member. When the poly silicon doping characteristics equal that of the layer of semiconductor material upon which it is deposited, it forms a good conductor and is usable as a contact. When the polycrystalline silicon doping characteristics are again the same as that of the layer of semiconductor material upon which it is deposited but opposite that of the structure to be isolated, it forms a good isolation member. Various processes are shown for advantageously fashioning polycrystalline silicon structures.

3,825,452

LIQUID EXPLOSIVE FOR WELL FRACTURING

Leonard N. Roberts, Scottsdale, Ariz., assignor to Talley-Frac Corporation, Pryor, Okla.

Original application Oct. 4, 1968, Ser. No. 765,113, now abandoned. Divided and this application Jan. 26, 1971, Ser. No. 109,774

Int. Cl. C06b *1/04*

U.S. Cl. 149—38 **12 Claims**

A cap insensitive liqud explosive is described which is particularly useful for fracturing a formation containing a network of narrow fissures adjacent a well bore in order to bring in a well or to increase its productivity, which includes a nitroparaffin compound, preferably

nitromethane, capable of dissolving substantial amounts of high explosive compounds, and one or more of certain high explosive compounds dissolved therein. The high explosive compounds are of a kind and are present in an amount capable of rendering the liquid explosive sufficiently diameter insensitive to permit propagation of an explosion throughout a substantial portion of such network of narrow fissures when the liquid explosive is placed therein or in such other environment as it is to be used. Preferred high explosives are RDX, HMX and mixtures thereof. TNT, PETN or any other high explosive organic nitro compound may be included in an amount sufficient to render the liquid explosive less sensitive to detonation, such that it is not cap detonable, at the same time enhancing its explosive power and reliability. For certain applications, ammonium nitrate may be added to achieve desired explosive effects, as well as finely divided reactive metal to increase the brisance of the explosive. A gelling agent such as nitrocellulose is included to maintain the resulting uniform dispersion for long periods of time. A method of pressure-transferring a liquid explosive into the well bore and pressuring it back into the productive formation is described in which the explosive is injected through a tube into the well bore directly adjacent the formation to be fractured, the tube having first been cleared of air, by placing the liquid explosive in one or more tanks connected to the injection tube at the well surface and which are subjected to air pressure to force the explosive into the well. Further, a well fracturing method which is self cleaning, rendering unnecessary the usual cleaning step which follows fracturing, is disclosed in which the well bore is restricted above the level of the explosion and is closed above the restriction with sand or the like such that sufficient back pressure is maintained in the well for satisfactory fracturing, while the resultant gases are subsequently vented through the restriction, blowing the sand or other ballast as well as the rubble generated by the explosion out of the well bore.

3,825,453

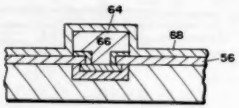
METHOD OF PREVENTING A CHEMICAL REACTION BETWEEN ALUMINUM AND SILICON DIOXIDE IN A SEMICONDUCTOR DEVICE

James R. Black and Robert J. Mattox, Phoenix, Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Continuation of abandoned application Ser. No. 860,983, Sept. 25, 1969. This application Dec. 20, 1971, Ser. No. 210,132

Int. Cl. C23c *11/08, 13/02*

U.S. Cl. 156—3 **5 Claims**



A method of preventing a chemical reaction in a semiconductor device between an aluminum film and a silicon dioxide substrate in contact therewith is disclosed. The method involves interposing a film of aluminum oxide between the aluminum film and the silicon dioxide substrate. A second step provides a layer of aluminum oxide on the silicon dioxide substrate adjacent the aluminum film.

3,825,454

METHOD OF FORMING INTERCONNECTIONS

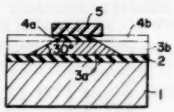
Akira Kikuchi, Takashi Agatsuma, and Akio Anzai, Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 20, 1973, Ser. No. 333,983

Claims priority, application Japan, Feb. 18, 1972, 47/16,432

Int. Cl. C23f *1/02*

U.S. Cl. 156—8 **12 Claims**



A method of forming interconnections, wherein unnecessary parts of a metal layer and a metal oxide film overlying the metal layer are etched using a mixed liquid etchant which consists of phosphoric acid, acetic acid, water, ammonium fluoride and nitric acid having a volumetric ratio of 76:15:5:2 to 6:3, whereby an interconnection portion with gently sloping corners is formed.

3,825,455

METHOD OF PRODUCING INSULATED-GATE FIELD-EFFECT SEMICONDUCTOR DEVICE HAVING A CHANNEL STOPPER REGION

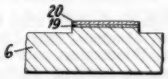
Sakari Takahashi, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Mar. 17, 1972, Ser. No. 235,503

Claims priority, application Japan, Mar. 19, 1971, 46/15,179

Int. Cl. H01l *7/50*

U.S. Cl. 156—11 **6 Claims**



A method of fabricating an insulated-gate field effect transistor including a channel stopper region is disclosed wherein an insulating film formed on the substrate serves as a mask during the formation of the channel stopper region.

3,825,456

SPINNERETTE PLATES AND SPINNERETTE EMPLOYING SAME

William A. Weber and Edmund H. Wellech, Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

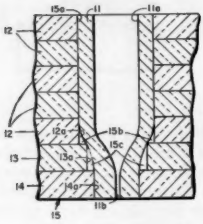
Original application Sept. 30, 1970, Ser. No. 76,796, now abandoned. Divided and this application Oct. 16, 1972, Ser. No. 297,979

Int. Cl. C03c *15/00*

U.S. Cl. 156—15 **4 Claims**

Holes in a pattern desired for a spinnerette are etched through each of a plurality of flat and relatively thin disks

of a photosensitively opacifiable glass each having a peripheral configuration corresponding to that of a spinnerette or spinnerette plate to be formed from the disks. The etched holes in each of the disks are of the same size but differ in size from some of the disks to others thereof so that such disks can be stacked to subsequently form a homogenous body or spinnerette plate having holes extending therethrough and generally conforming to the outer configuration of each of a plurality of spinnerette capillary members which are formed of a thermally crystallizable glass and which are subsequently inserted



in the holes. The disks and capillary members are exposed to short wave radiations such as rays of ultraviolet light and the assembly, comprising the disks and spinnerette capillary members, are subsequently subjected to a heat and pressure cycle to fuse the disks to each other and to the capillary members and, simultaneously therewith, convert the assembly to a ceramic body to provide a ceramic spinnerette of a very strong, durable and corrosion resistant material, and embodying spinnerette capillaries having very smooth sidewalls extending through the spinnerette.

3,825,457

METHOD OF MOULDING HOLLOW RUBBER ARTICLES

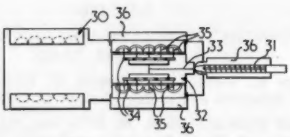
Eric Holroyd, High Legh Park, near Knutsford, Anthony G. Goodfellow, Maghull, near Liverpool, and James N. McGlashen, Winstanley, near Wigan, England, assignors to Dunlop Limited, Erdington, Birmingham, England

Filed Nov. 15, 1971, Ser. No. 198,812

Claims priority, application Great Britain, Nov. 23, 1970, 55,586/70

Int. Cl. B29c *1/00*

U.S. Cl. 156—147 **9 Claims**



A method for moulding a hollow rubber article in which the article is formed as two separate halves of uncured rubber, the halves having locking sprues to prevent their displacement, the mould is pressurized with gas and the halves are then brought together and joined and cured.

3,825,458

METHOD OF MAKING HYDROGEL LAMINATES

Otto Wichterle and Karel Kliment, Prague, Czechoslovakia, assignors to Ceskoslovenska Akademie ved, Prague, Czechoslovakia

No Drawing. Original application Feb. 25, 1969, Ser. No. 808,202, now abandoned. Divided and this application Nov. 22, 1971, Ser. No. 201,235

Claims priority, application Czechoslovakia, Mar. 6, 1968, 1,767/68

Int. Cl. B29d *7/02*

U.S. Cl. 156—242 **13 Claims**

A comparatively thick sheet of a spongy hydrogel, made e.g. by polymerizing ethylene glycol monomethacrylate in presence of less than 2 percent of a cross-linking agent and more than 60 percent of water, is laminated with a much thinner sheet of the same or similar, but homogeneous hydrogel, either from one side or from both sides. Alternatively, one external layer may be less hydrophilic or fully hydrophobic. The lamination is carried out so that the external thin layer is made on a glass or other smooth pad, either by polymerizing a cross-linked or linear polymer thereon, or by casting a thin layer of a dissolved linear polymer. Then a monomer mixture for spongy hydrogel is cast onto the first layer and polymerized. A sandwich structure is obtained if the monomer mixture for spongy hydrogel is cast between two pads provided with a thin homogeneous polymer layer. Hydrogel laminates and sandwich structures are useful e.g. for surgical and cosmetic purposes, for filtering liquids etc.

3,825,459

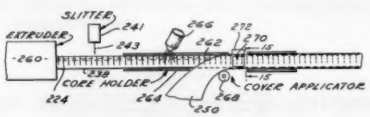
METHOD OF MAKING FLEXIBLE MOLDING STRIP

Alfred E. Taylor, Grosse Pointe, Mich.

Application Jan. 10, 1972, Ser. No. 216,409, now Patent No. 3,706,173, dated Dec. 19, 1972, which is a continuation-in-part of abandoned application Ser. No. 850,434, Aug. 15, 1969. Divided and this application Sept. 18, 1972, Ser. No. 290,156

Int. Cl. B32b *31/12*

U.S. Cl. 156—244 **5 Claims**



A flexible molding strip including a non-metal channel-shaped core member having a plurality of transverse slots providing the requisite molding flexibility, and a stretchable cover enclosing the core member and concealing the slots. The core member includes opposed gripping flanges within the channel adapted to secure the molding, and the cover may be stretched over the core to prevent buckling when the molding is secured over a relatively sharp radius. The cover may also include a laterally extending flange or wing to conceal a joint or the like.

3,825,460

THIN-WALLED CARBONACEOUS HONEYCOMB STRUCTURES AND PROCESS FOR MAKING SAME

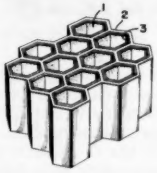
Takayuki Yoshikawa and Eiichi Hisada, Nagoya, and Tooru Hujii, Yokkaichi, Japan, assignors to Nippon Toki Kabushiki Kaisha (Noritake Co., Ltd.), Nagoya-shi, Japan

Filed Dec. 29, 1971, Ser. No. 213,425

Claims priority, application Japan, May 18, 1971, 46/33,519

Int. Cl. B29c *25/00;* B32b *1/08*

U.S. Cl. 156—296 10 Claims



A thin-walled carbonaceous honeycomb structure having a large surface to weight ratio and consisting of thin-walled carbonaceous cells; and a process for making the same. The process includes coating elongated tube or rod elements with a coating material capable of being carbonized, arranging the elongated elements so that they contact one another to form a honeycomb-like block, drying the coated elements so arranged, removing the elongated element substrates from the dried honeycomb-like block if the substrates, themselves, are not capable of being carbonized, and firing said honeycomb-like block to achieve the carbonaceous product.

3,825,461

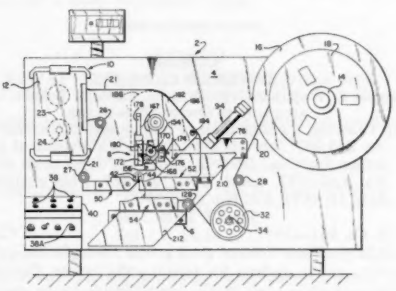
SPLICING HEAD ASSEMBLY

Robert H. Gorman, Hudson, Mass., assignor to King Instrument Corporation, Hudson, Mass.

Filed Jan. 29, 1973, Ser. No. 327,507

Int. Cl. B65h *69/02*

U.S. Cl. 156—502 18 Claims



A splicing head assembly for use in a machine for splicing magnetic tape to a leader attracted to one of the hubs of a cassette, winding a selected amount of tape on that hub, and then attaching the trailing end of the tape to a leader on the other hub of the cassette. The assembly comprises three splicing blocks or tape support elements each having a guideway for aligning tape to be spliced and suction means for holding a tape in position in the guideway. Two of the splicing blocks are spaced vertically and means are provided for producing relative movement between those blocks and the third block so that the guideway of the third block is aligned alternately with the guideways of the other two blocks.

3,825,462

APPARATUS FOR COATING CHIPBOARD WITH A LAMINATED SHEET OR FOIL

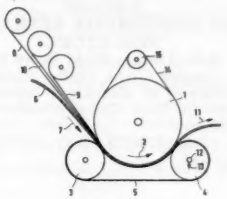
Hubert Ettel, Teichhutte, Harz, Germany, assignor to Wilhelm Mende & Co.

Filed Dec. 22, 1972, Ser. No. 317,681

Claims priority, application Germany, Jan. 12, 1972, P 22 01 302.1

Int. Cl. B32b *31/20;* B31f *1/00*

U.S. Cl. 156—582 6 Claims



A thermoplastic sheet is bonded to a thin chipboard by positioning the sheet and board on a continuously moving belt, heating the sheet and board to render the sheet plastic and pressing the sheet into intimate contact with the surface of the chipboard to bond the sheet thereto.

3,825,463

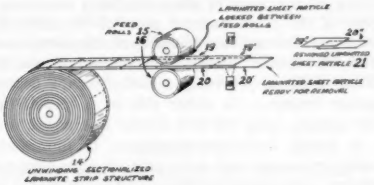
SECTIONALIZED LAMINATE STRIP STRUCTURE

John A. Amann, 19 Alemeda Place, Mount Vernon, N.Y. 10552

Filed Apr. 30, 1973, Ser. No. 355,588

Int. Cl. B32b *7/06, 3/16*

U.S. Cl. 161—36 10 Claims

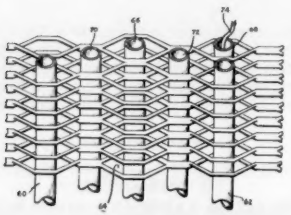


The present invention relates to a process for continuously manufacturing a sectionalized laminate strip structure comprising a series of individually dispensable pressure-sensitive adhesive backed sheet articles, the resulting product, and improvements in the apparatus for dispensing same.

3,825,464
FLAME-RETARDANT CARPET AND METHOD OF PREPARING SAME
Richard P. Crowley, Harbor Towers II, Suite 24H, 65 E. India Row, Boston, Mass. 02110
No Drawing. Continuation-in-part of application Ser. No. 25,275, Apr. 2, 1970, now Patent No. 3,694,873, dated Oct. 3, 1972, which is a continuation-in-part of application Ser. No. 872,498, Oct. 30, 1969, now Patent No. 3,686,046, dated Aug. 22, 1972. This application July 31, 1972, Ser. No. 276,527
Int. Cl. B32b *27/12, 27/18*
U.S. Cl. 161—67 22 Claims

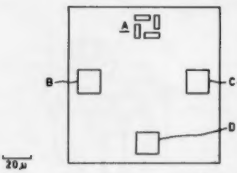
A flame-retardant carpet which comprises a solid polymeric backing sheet, such as a flexible polyvinyl chloride or a nonwoven polypropylene sheet to which fibers have been secured to said backing sheet, the fibers providing a fiber face and the backing sheet containing a flame-retardant amount of an undecomposed blowing agent, such as azodicarbonamide, whereby on exposure of the carpet to open-flame or high temperatures, the blowing agent provides, such as by decomposition, a flame-retardant quantity of an inert gas.

3,825,465
THREE DIMENSIONAL RETICULATED STRUCTURE
Robert Stock, 12311 Buaro St., Garden Grove, Calif. 92640
Continuation-in-part of abandoned application Ser. No. 62,337, Nov. 13, 1970. This application Mar. 24, 1972, Ser. No. 237,744
Int. Cl. B32b *13/02, 33/00*
U.S. Cl. 161—112 10 Claims



A three dimensional, open mesh structure is described which is fabricated from sheet stock of metal, paper or the like. The sheet stock is slit in a predetermined pattern and then is expanded to form the structure. The structure has a three dimensional shape with a reticulated pattern of apertures in planar surfaces transverse to the plane of the sheet material prior to its expansion. The structure is formed by a plurality of unbroken, continuous strips of material lying in a plurality of superimposed planes, each strip having a sinuous path departing in regular frequency to either side of a medial line with web sections lying on said medial line where each strip is in joined, unbroken attachment to immediately adjacent strips and with each pair of such adjacent strips defining said apertures. The structure is useful to form the core of a wall with elongated reinforcement members disposed perpendicular to the planar surfaces and extending through superimposed apertures of the reticulated pattern. The wall comprises the aforementioned assembly of reinforcement members and three dimensional structure with a plastic material such as plaster encasing the assembly.

3,825,466
METHODS OF PRODUCING FILMS COMPRISING SILICEOUS MATERIAL AND THE ARTICLE FORMED THEREBY
Barry Forester Martin and Edward David Roberts, Salfords, near Redhill, England, assignors to U.S. Philips Coporation
Filed Mar. 13, 1972, Ser. No. 234,193
Claims priority, application Great Britain, Mar. 15, 1971, 6,884/71
Int. Cl. C03c *15/00*
U.S. Cl. 161—113 15 Claims



Method of producing an apertured siliceous film on a substrate comprising applying a layer of a polysiloxane mixture to the substrate, irradiating the layer with an electron beam in accordance with a desired pattern, etching to the layer to remove the irradiated portions and heating the etched layer to decompose the organic material and leave an apertured siliceous film on the substrate.

3,825,467
PRESSURE-SENSITIVE RECORD SHEET MATERIAL
Paul S. Phillips, Jr., Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio
Filed Jan. 24, 1972, Ser. No. 220,002
Int. Cl. B32b *5/18*
U.S. Cl. 161—159 2 Claims

A pressure-responsive record sheet material including a substrate sheet with a coating of pressure-releasable liquid droplets of marking materal isolated by polymeric film material and releasable by marking pressures, wherein said droplets are protected from accidental release, as by scuffing and rolling pressures, by an over-sheet of thin, porous paper bonded adhesively to said coating.

3,825,468
SINTERED CERAMIC
Gerald E. Wojcik and William M. Lawson, Toledo, Ohio, assignors to Owens-Illinois, Inc.
No Drawing. Continuation of abandoned application Ser. No. 845,087, July 25, 1969, which is a division of application Ser. No. 594,408, Nov. 15, 1966, now Patent No. 3,486,872, dated Dec. 30, 1969. This application Aug. 25, 1971, Ser. No. 175,009
Int. Cl. B32b *3/26*
U.S. Cl. 161—161 3 Claims

A crystallized sintered glass article having a non-porous surface and a method for forming the article. Crystallizable particulate glass that is crystallizable by *in situ* crystallization to a glass-ceramic is first arranged into a desired coherent but unfired shaped article. The article is then sintered to form a porous glass article which is then thermally crystallized at a temperature higher than that employed to effect the sintering. A porous glass-ceramic is

thus formed having dispersed throughout a multitude of crystals of a plurality of crystalline species having a plurality of different melting points. The porous glass-ceramic article is then heated at a still higher temperature sufficient to melt a portion but not all of the crystals and form a non-porous surface on the glass-ceramic.

3,825,469

BORON CARBIDE FIBER PRODUCTION

James Economy, Eggertsville, and Vlado I. Matkovich, Williamsville, N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

No Drawing. Original application Nov. 14, 1969, Ser. No. 877,036, now Patent No. 3,725,533. Divided and this application July 3, 1972, Ser. No. 268,421

Int. Cl. C01b *31/36;* D02g *3/02*

U.S. Cl. 161—172 9 Claims

Boric oxide fibers having a maximum diameter of about 10 microns are heated in an ammonia atmosphere to about 350–600° C. at a rate of temperature rise of up to about 5000° C./hr. to produce ammonia-treated fibers consisting essentially of B, N, O and H. The ammonia-treated fibers are heated in an amine atmosphere at about 600–1000° C. to produce amine-treated fibers consisting essentially of B, C, N, O and H and containing at least about 15% C. The amine-treated fibers may be heated at about 2000–2350° C. in an inert atmosphere to produce boron carbide fibers.

3,825,470

ADHESIVELY ERADICABLE TRANSFER MEDIUM

Donald L. Elbert and Glen A. Waldrip, Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

No Drawing. Filed Aug. 3, 1972, Ser. No. 277,696

Int. Cl. B32b *27/34;* B41m *5/16*

U.S. Cl. 161—227 10 Claims

A transfer medium or typewriter ribbon is disclosed, which is capable of being utilized to imprint a letter and if the letter is erroneous, which is susceptible of adhesive removal. The ribbon is made of a hard, film forming resin with selective modification of its properties through the addition of additives which embrittle the film and make the resin more adherent for the imaging surface while not penetrating into the fibers of the paper imaging surface, and attaching itself. As time passes there is an increased attachment to the paper fibers thereby rendering a more permanent image.

3,825,471

KENAF CARDBOARD AND METHOD FOR PRODUCTION THEREOF

Yakov Iosifovich Fraiman, Kuibyshevskoe shosse 23, korpus 30, Tashkent, U.S.S.R.

No Drawing. Filed Nov. 13, 1972, Ser. No. 306,349

Claims priority, application U.S.S.R., Nov. 17, 1971, 1715162

Int. Cl. D21h *5/12*

U.S. Cl. 162—147 3 Claims

Cardboard for use in making roller discs for roller gins employed in cotton ginning, including shredded kenaf fibres, cotton rags, fibrous gin waste, and a binder which is a mixture of rosin and bitumen. The method for its protection is characterized by the extent of shredding of the fibrous components and their subsequent mixing with the shredded kenaf fibres.

3,825,472

METHOD OF PRODUCING L-LYSINE BY FERMENTATION

Koji Kubota and Yasuhiko Yoshihara, Kawasaki, Hayao Hirakawa, Yokohama, Hirotaka Kamijo, Kawasaki, Shigeki Nosaki, Isehara, Fumihiro Yoshinaga, Fujisawa, and Shinji Okumura and Hiroshi Okada, Tokyo, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

No Drawing. Continuation-in-part of abandoned application Ser. No. 353,635, Apr. 23, 1973. This application Oct. 2, 1973, Ser. No. 402,818

Claims priority, application Japan, Apr. 27, 1972, 47/42,527; Aug. 18, 1972, 47/82,641; Sept. 19, 1972, 47/94,030; Nov. 30, 1972, 47/120,247

Int. Cl. C12d *1/00*

U.S. Cl. 195—29 9 Claims

Artificially induced mutants of *Brevibacterium lactofermentum, Corynebacterium glutamicum, Corynebacterium lilium,* and *Corynebacterium acetoacidophilum* which resist feedback inhibition by S-(2-aminoethyl)-cysteine and require at least one supplemental nutrient which is herine, proline, alanine, nicotinamide, nicotinic acid, pantothenic acid, thiamine, guanidine, adenine, hypoxanthine, or vitamin B_{12} produce L-lysine by fermentation of otherwise conventional culture media in higher yields than the parent strains lacking the nutrient requirement.

3,825,473

PRODUCTION OF CEPHALOSPORIN C

Francesco Gargiuolo, Bologna, Italy, assignor to Alfa Farmaceutici, S.p.A., Bologna, Italy

No Drawing. Filed Aug. 4, 1972, Ser. No. 277,881

Claims priority, application Great Britain, Aug. 13, 1971, 38,149/71

Int. Cl. C12d *9/22*

U.S. Cl. 195—36 R 18 Claims

Cephalosporin C, which is useful as a starting material in the preparation of the semi-synthetic cephalosporin antibiotics, is produced by the aerobic cultivation of a novel microorganism, *Cephalosporium Sp.* strain F. 12 (ATCC 20339). The cultivation is performed in a nutrient medium containing assimilable sources of carbon and nitrogen, one or more inorganic salts, and an organic source of sulfur. High yields of Cephalosporin C are obtained, with reduced yields of the undesirable by-product Cephalosporin N, by comparison with previously used *Cephalosporium* strains.

3,825,474

PROTEUS RESISTANT AGAR CULTURE MEDIA

Patricia P. Cooper, Claymont, Del. (1905 Fairfield Drive, Wilmington, Del. 19810)

No Drawing. Filed June 22, 1972, Ser. No. 265,324

Int. Cl. C12k *1/04*

U.S. Cl. 195—103.5 R 3 Claims

The addition of penicillin G during the preparation of agar media results in *Proteus* resistant agar media which can be used in the isolation of gram-negative micro-organisms.

3,825,475

PROCESS AND DEVICE FOR PRODUCING MICROORGANISMIC MATTER

Alicia L. Compere-Whitney, Knoxville, Tenn., assignor to Imperatrix, Palo Alto, Calif.

Filed Sept. 25, 1972, Ser. No. 291,766

Int. Cl. C12b *1/00*

U.S. Cl. 195—104 11 Claims

A substrate for rapidly growing a microorganism is disclosed. The substrate comprises a liquidophilic matrix

having a high surface area. The matrix is adapted to retain a volume of liquid. The surface area of the matrix is sufficiently high to provide a ratio of the surface area available as a substrate to the volume of retainable liquid of at least 10 meter²/liter. A process for producing a microorganism is also disclosed. The process comprises contacting a microorganism or its precursor in a suitable vessel with the high surface area liquidophilic matrix, sufficient liquid to wet the matrix, and essential nutrients, whereby desired products, often including additional microorganism, are produced.

3,825,476

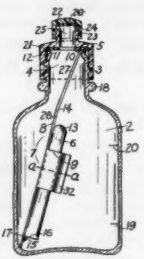
SAMPLER-CULTURE APPARATUS FOR THE DETECTION OF COLIFORM BACTERIAL IN POTABLE WATERS

A. Adler Hirsch, 141 Norwood St., Shreveport, La. 71105

Original application Nov. 17, 1971, Ser. No. 199,648, now Patent No. 3,708,040, dated Jan. 2, 1973. Divided and this application Oct. 2, 1972, Ser. No. 294,472

Int. Cl. C12k *1/10*

U.S .Cl. 195—127 **10 Claims**



A go-no-go gage to determine directly whether bacterial quality of a drinking water sample meets the U.S. Public Health Service Standards in which all laboratory manipulations are eliminated from sampling to gas observation. The apparatus is creep-proof; it avoids exposures and the operations are precise. Gas from fermentation shows in a Durham vial held diagonally in a screw cap bottle by being clamped in a cage thereby eliminating all axial and lateral motion. A confirmatory Brilliant Green Bile broth tube is seeded by pressing into the screw cap and inverting, or by exchanging the auxiliary cap after inversion with a like size cap on the confirmatory vial thus obviating all extraneous utensils throughout the procedure.

3,825,477

FLUIDIZED BED REACTOR

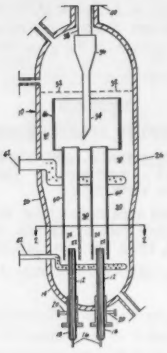
Joseph F. McMahon, Clinton, N.J., assignor to Foster Wheeler Corporation, Livingston, N.J.

Filed May 12, 1972, Ser. No. 252,891

Int. Cl. C10g *7/00*

U.S. Cl. 196—126 **4 Claims**

A fluidized bed reactor for producing a gas rich in ethane and methane in which coking is inhibited and which operates at high efficiency. Oil and hydrogen are



reacted in the reactor which has means to insure thorough mixing of the oil with the coke particles.

ERRATUM

For Class 202—176 see:
Patent No. 3,825,491

3,825,478

ELECTROLYTE AND METHOD FOR ELECTRO-DEPOSITING MICROPOROUS CHROMIUM-NICKEL COMPOSITE COATINGS

Richard J. Clauss, Allen Park, Thaddeus W. Tomaszewski, Dearborn, and Henry Brown, Huntington Woods, Mich., assignors to Oxy Metal Finishing Corporation, Warren, Mich.

No Drawing. Filed Oct. 30, 1972, Ser. No. 302,170

Int. Cl. C23b *5/08, 5/50*

U.S. Cl. 204—41 **46 Claims**

An aqueous nickel electroplating bath solution comprising nickel ions, a bath soluble nitrogen containing compound and a bath soluble metal salt which in the bath will produce a metal containing cation whose pH precipitation point is lower than that of the pH precipitation point of nickel in said bath.

3,825,479

RADIATION CURABLE PRINTING INK COMPOSITIONS COMPRISING AN ISOCYANATE-MODIFIED POLYFUNCTIONAL ESTER AND A PHOTOINITIATOR

Daniel J. Carlick, Northbrook, Ill., Frank Marra, Wayne, N.J., and Gerhard E. Sprenger, North Stonington, Conn., assignors to Sun Chemical Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 282,320, Aug. 21, 1972, which is a continuation-in-part of application Ser. No. 82,516, Oct. 20, 1970, which in turn is a continuation-in-part of application Ser. No. 850,633, Aug. 15, 1969, all now abandoned. This application May 31, 1973, Ser. No. 365,712

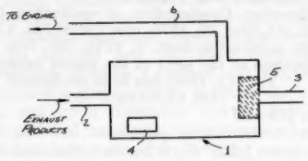
The portion of the term of the patent subsequent to Sept. 18, 1990, has been disclaimed

Int. Cl. C08d *1/00;* **C08f** *1/16*

U.S. Cl. 204—159.23 **10 Claims**

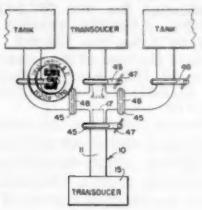
A photopolymerizable printing ink comprises at least one isocyanate-modified polyfunctional ester having a hydroxyl value of about 15–70, at least one photoinitiator, and a colorant.

3,825,480
SONIC ENERGY EXHAUST FILTER
Arnold H. Pelofsky, Monument, Colo. 80132; Dan T. Felix, Pebble Beach Drive, Woodmoor, Monument, Colo. 80132; and Gary N. Herbert, 905 W. Cheyenne Road, Colorado Springs, Colo. 80906
Continuation-in-part of abandoned application Ser. No. 889,779, Dec. 11, 1969, which is a division of application Ser. No. 619,944, Mar. 2, 1967, now Patent No. 3,497,005. This application Dec. 8, 1971, Ser. No. 206,011
Int. Cl. B01j *1/12*
U.S. Cl. 204—193 **6 Claims**



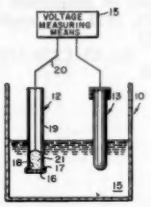
A process for rupturing molecular bonds in a material using sonic energy. The material is subjected to sonic energy, and in a modification of the process it may be contacted with a carrier agent prior to being subjected to the sonic energy.

3,825,481
FLUID FLOW SONIC ENERGY REACTOR
Michael C. Supitilov, St. Charles, Ill., assignor to Du Kane Corporation, St. Charles, Ill.
Filed Apr. 30, 1973, Ser. No. 356,011
Int. Cl. B01k *1/00;* **A23l** *3/30*
U.S. Cl. 204—193 **11 Claims**



A sonic energy reactor for handling a stream of fluid consists of a horn having a length of an integral number of ½ wave lengths, said horn having a sonic input and a sonic output for longitudinal vibration. About a nodal region of the horn is an external, integral mounting flange. Associated with the horn is a fitting having at least three pipe stubs extending from the fitting body with the stub interiors communicating with a chamber within the fitting body for fluid flow between stubs. At least one of the stubs is sufficiently large to permit the horn portion between the horn output end and the mounting flange to be inserted into said one stub interior, the relative dimensions being such that the free end of such horn constituting the sonic energy output end reaches a desired location in the chamber in the fitting body interior. The free end of said one pipe stub is shaped to cooperate with the horn mounting flange and additional parts for providing a detachable coupling between the horn and fitting. This detachable coupling includes among other things a gasket of sonic energy insulating means such as rubber for inhibiting the escape of sonic energy from the horn to the fitting and to contain the fluid. Sonic energy discharged at the output end of the horn is effective to act upon material flowing past the horn portion for sonic energy irradiation. The remaining stubs of the fitting are adapted to function as fluid flow inlets and outlets and if sufficient stubs are available, may accommodate additional horns for irradiation. All stubs are detachably coupled to fluid feed pipes or one or more ultra-sonic horns. Such a construction permits ready assembly and/or disassembly of all components constituting the reactor and horn assembly permitting cleaning, sterilization and visual examination for observing the amount of physical wear of said horn output end. By controlling the relative dimensions of a fitting pipe stub and horn, the relative disposition of the output end of a horn within a fitting chamber may be controlled for the purpose of subjecting fluid particles to compression, tension and/or shear, the latter depending upon the relative shapes of the surfaces of horn and fitting interiors. By selecting appropriate materials, usually metals such as stainless steel, titanium and utilizing standardized and accepted fittings available in the market, a sonic energy reaction device may be available for use in food treatment processes, cosmetics, drugs, corrosive chemicals and various other fields where standard or special fittings are available.

3,825,482
ION-SELECTIVE ELECTRODES USING TUNGSTEN BRONZES AS ACTIVE ELEMENT
Margaret A. Wechter, Hammond, Ind., and Howard R. Shanks, Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa
Filed Feb. 16, 1972, Ser. No. 226,862
Int. Cl. G01n *27/46*
U.S. Cl. 204—195 M **6 Claims**

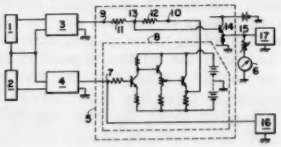


Tungsten bronzes, which are compounds having a general formula A_xWO_3 where x is any value between zero and one exclusive have been found to function as the active element in ion-selective electrodes. They have been found to be sensitive to mercury, silver and iron in solution.

3,825,483
RED-OX POTENTIOMETER PROVIDED WITH A pH CORRECTION CIRCUIT
Toshihiko Nakamura, Yokohama, Japan, assignor to Nihon Filter Co., Ltd., Tokyo, Japan
Filed Nov. 6, 1972, Ser. No. 303,788
Int. Cl. G01n *27/46*
U.S. Cl. 204—195 R **2 Claims**

A red-ox potentiometer which comprises a pH detecting part having a pH measuring electrode and a reference electrode, and a pH correction circuit having circuit constants selected according to the red-ox potential characteristics of a metallic ion containing solution to be tested, in addition to a red-ox potential detecting part having a red-ox electrode and a reference electrode, the

red-ox potential and the pH electromotive force of the solution tested are detected respectively by said red-ox detecting part and pH detecting part, the output voltage from said pH detecting part is combined in said pH correction circuit with the output voltage from said red-ox detecting part to compensate the variations of red-ox potential caused by the variations of pH value of the solution, thereby a resultant voltage which represent al-



ways the red-ox potential corresponding to a predetermined pH value of the solution regardless of the variations of pH value of the solution is delivered from the output terminals of the pH correction circuit as a corrected output voltage of said circuit, and said corrected voltage is utilized for indicating the red-ox potential corresponding to said predetermined pH value of the solution or controlling the red-ox degree of the solution.

3,825,484

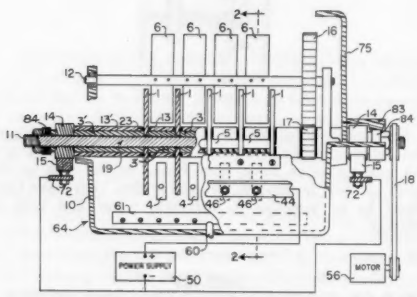
ELECTROLYTIC REGENERATOR FOR CHEMICAL ETCHANTS INCLUDING SCRAPER MEANS AND ROTATING CATHODES

Lewis N. Fronsman and Nathan F. Fronsman, both of 641 Ross Street, Costa Mesa, Calif. 92627

Continuation-in-part of abandoned application Ser. No. 138,565, Apr. 29, 1971. This application Mar. 6, 1973, Ser. No. 338,923

Int. Cl. C23b *5/68*

U.S. Cl. 204—216 **9 Claims**



An electrolytic cell apparatus for the regeneration of chemical etchants, such as the ferric chloride solution used in the printed circuit industry. In regenerating such ferric chloride, metallic sponge copper is obtained as a by-product. The process becomes economic at high current densities, which are made practicable by novel structural features. The cathodes of the apparatus are stacked, spaced, slowly-rotating discs of, e.g., titanium. The anodes are stationary plates, preferably of a graphitic material, disposed between the disc cathodes. Mechanical wipers and collectors scrape the sponge copper from the disc cathodes and dump it into a collection bin. The regenerator apparatus is preferably installed in connection with a conventional etching apparatus, the ferric chloride or other etchant being continuously circulated from etcher to regenerator, and back again. The market value of the recovered copper approximately equals the cost of the electric energy required for regeneration.

3,825,485

HYDROCRACKING EFFLUENT COOLING PRIOR TO HYDRODESULFURIZATION

William R. Coons, Jr., Groves, James H. Colvert, Houston, and Gerald V. Nelson, Nederland, Tex., assignors to Texaco Inc., New York, N.Y.

No Drawing. Continuation of application Ser. No. 102,251, Dec. 28, 1970, now Patent No. 3,716,476. This application Sept. 7, 1972, Ser. No. 287,135

The portion of the term of the patent subsequent to Feb. 13, 1990, has been disclaimed

Int. Cl. C10g *37/00*

U.S. Cl. 208—97 **9 Claims**

A residue-containing petroleum fraction, 50 percent boiling above 1,000° F., is hydrocracked and then hydrodesulfurized. During the onstream period, the conversion level of material boiling above 1,000° F. is maintained substantially constant while the sulfur content of the hydrocracked effluent increases. The sulfur content of a product fraction is maintained substantially constant by gradually increasing the hydrodesulfurization temperature. The effluent from the hydrocracking reaction is cooled by adding an aromatic-rich fraction and the cooled mixture is passed to the desulfurization reaction.

3,825,486

METHOD OF CONVERTING HYDROCARBONS WITH MANGANESE NODULE CATALYSTS

Joseph N. Miale, Trenton, N.J., assignor to Mobil Oil Corporation

No Drawing. Application Apr. 24, 1970, Ser. No. 31,776, now Patent No. 3,676,369, which is a continuation-in-part of application Ser. No. 597,243, Nov. 28, 1966, now Patent No. 3,509,041. Divided and this application Apr. 17, 1972, Ser. No. 244,988

The portion of the term of the patent subsequent to Apr. 28, 1987, has been disclaimed

Int. Cl. B01j *9/20;* **C10g** *13/02, 5/72*

U.S. Cl. 208—110 **9 Claims**

This specification discloses the conversion of hydrocarbons employing a catalyst comprising a base-exchanged, calcined manganese silicate-containing mineral in the form of a manganese nodule, said mineral having hydrogen ions bonded thereto in an amount of at least 0.01 gram per 100 grams of said mineral.

3,825,487

METHOD FOR SIMULTANEOUSLY PRODUCING SYNTHETIC NATURAL GAS AND HIGH OCTANE REFORMATE

Frederick C. Wilhelm, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Sept. 5, 1972, Ser. No. 286,652

Int. Cl. C10g *35/06*

U.S. Cl. 208—139 **11 Claims**

A synthetic natural gas stream and a high octane reformate stream are produced by contacting a hydrocarbon charge stock boiling in the gasoline range and hydrogen, at synthetic natural gas production conditions, with a catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. percent of a platinum group metal, about 1 to about 5 wt. percent nickel and about 0.01 to about 5 wt. percent of a Group IVA metal. Synthetic natural gas production conditions generally utilized include a temperature of about 900 to about 1200° F., a pressure of

about 0 to about 350 p.s.i.g., liquid hourly spaced velocity about 0.5 to about 3 hrs.$^{-1}$ and a mole ratio of hydrogen to hydrocarbon of about 1:1 to about 5:1.

3,825,488

PROCESS FOR HYDROREFINING A HYDROCARBON CHARGE STOCK

John G. Gatsis, Des Plaines, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed May 7, 1973, Ser. No. 358,198

Int. Cl. C10g *23/06, 31/14*

U.S. Cl. 208—212 **6 Claims**

This invention relates to a process for the hydrorefining of petroleum crude oils, heavy vacuum gas oils, heavy cycle stocks, crude oil residuum, topped crude oil, tar sand oil, shale oil, liquefied coal, etc. More specifically the present invention involves a process for hydrorefining heavy hydrocarbon charge stocks to effect the removal of nitrogen and sulfur therefrom, and is advantageous when employed for the destructive removal of organometallic contaminants and particularly the conversion of pentane-insoluble hydrocarbonaceous material.

3,825,489

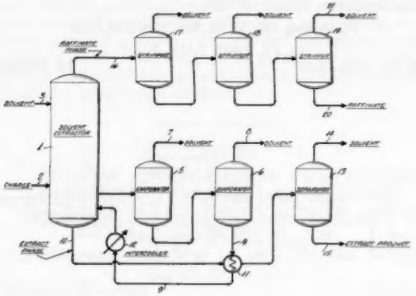
EXTRACTION PROCESS

Ib Steinmetz, Wilmington, Del., and William Wayne Wentzheimer, Glen Mills, Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Nov. 21, 1972, Ser. No. 308,377

Int. Cl. C10g *21/16*

U.S. Cl. 208—327 **2 Claims**



A solvent extraction process, more particularly a furfural extraction process wherein a portion of the extract phase is withdrawn from the extraction zone, concentrated and cooled by evaporation of part of the solvent contained therein and by cooling means and returned to the extraction vessel, thereby enhancing the aromatic-paraffinic separation taking place therein.

3,825,490

MOLECULAR SIEVE SELECTIVE ADSORPTION PROCESS

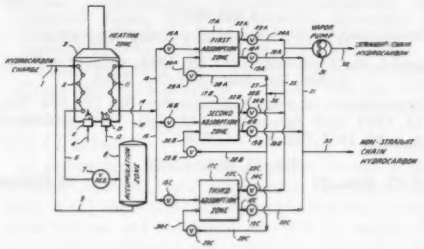
George W. Vachuda, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Feb. 14, 1972, Ser. No. 225,947

Int. Cl. C07c *7/12*

U.S. Cl. 208—310 **4 Claims**

A molecular sieve selective adsorption process for separating non-straight chain hydrocarbons from a C_5–C_9 charge mixture of straight chain and non-straight chain hydrocarbons incorporating a charge vaporization system wherein liquid charge is partially vaporized in a first heating zone at an elevated pressure, wherein partially vaporized charge is totally vaporized by adiabatic expansion in an expansion zone exterior to the heating zone, and wherein the vaporized charge is superheated in a second heating zone prior to admission into an adsorption zone.



3,825,491

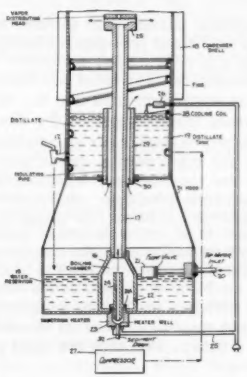
WATER DISTILLER AND COOLER UNIT

Gil C. Sanchez, 2915 Miles Ave., Bronx, N.Y. 10465

Filed July 14, 1972, Ser. No. 271,732

Int. Cl. B01d *3/00, 3/42*

U.S. Cl. 202—176 **9 Claims**



A water distiller and cooler unit adapted to be coupled to a water line or other source yielding water of relatively poor quality, the unit producing a supply of chilled, distilled water of high purity and neutral taste. The unit is constituted by a water reservoir coupled to the water line and including a boiling chamber having a heater therein, the water being admitted into the chamber at a rate determined by the capacity of the heater to volatilize water. The steam generated in the boiling chamber is fed to a condenser shell mounted above a distillate tank which

is provided with a spigot, the distillate falling into the tank. The unit also includes a mechanical refrigerator system whose cooling coils are disposed partly in the condenser shell and partly in the distillate tank, the coils serving to promote condensation and to chill the resultant distillate.

3,825,492

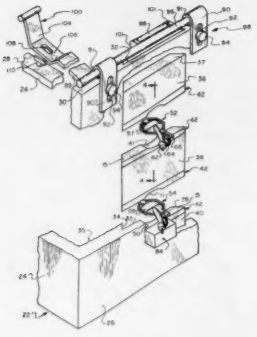
BLOOD PORT ASSEMBLY AND METHOD

David L. Radford, Salt Lake City, Utah, assignor to Vital Assists, Inc., Salt Lake City, Utah

Continuation-in-part of application Ser. No. 106,184, Jan. 13, 1971, now Patent No. 3,723,305. This application Apr. 11, 1972, Ser. No. 243,016

Int. Cl. B01d *13/00*

U.S. Cl. 210—22 **16 Claims**



An extracorporeal hemodialyzer includes at least one novel generally rigid blood port communicating a patient's blood into and out of a tubular membrane comprising part of the hemodialyzer. The blood port has a contoured exterior element which is inserted into the tubular membrane. A reference tab is formed on the blood port and is situated adjacent a fixed guide to establish a proper orientation for the blood port. A seal is formed between the membrane and the blood port when the blood port is inserted between correspondingly contoured sliding members which are thereafter urged tightly together. The sliding members may be set into a channel in the exterior wall of the hemodialyzer and urged upon the blood port by a lever-action clamp. An improved method of attaching the membrane to the blood port includes the steps of inserting the blood port into the tubular membrane so that a reference tab and coupling element are exposed and thereafter creating a fluid seal between the blood port and the membrane.

3,825,493

PERITONEAL ARTIFICIAL KIDNEY

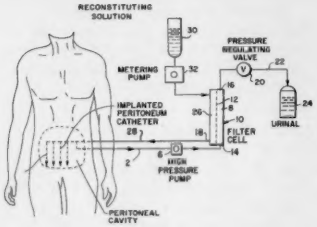
Clinton E. Brown, Silver Spring, Md., and Moshe-Aharon Frommer, Rehovoth, Israel, assignors to Hydronautics, Incorporated, Laurel, Md.

Filed Sept. 29, 1972, Ser. No. 293,474

Int. Cl. B01d *31/00, 13/00*

U.S. Cl. 210—23 **7 Claims**

A peritoneal artificial kidney in which a prepared solution is circulated through the peritoneal cavity and the resulting peritoneal fluid containing unwanted toxic metabolites is withdrawn from the cavity and passed through filtration means that permits essentially only



passage of pure water while rejecting the metabolites. The filtered peritoneal fluid is then reconstituted with a controlled make-up solution for recycle to the peritoneal cavity and the rejected residue is discharged as waste.

3,825,494

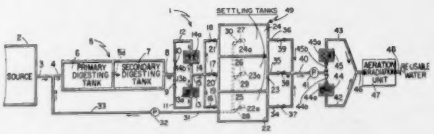
MINI SEWAGE TREATMENT SYSTEM

Donald H. Call, 39 Garth Road, West Roxbury, Mass. 02132; Elbridge L. Atwood, Lantern Lane, Abington, Mass. 02351; Joseph A. Cary, 134 Auburn St., Brockton, Mass. 02402; and James D. Surette, 105 Prospect St., Braintree, Mass. 02184

Filed Aug. 30, 1972, Ser. No. 284,726

Int. Cl. C02b *1/18, 3/00*

U.S. Cl. 210—138 **10 Claims**



This invention pertains to an efficient ecological waste sewage system which eliminates the necessity of large leaching beds or seepage pits from cesspool digested sewage effluents. It consists of the system and the apparatus for effecting the disposal of such sewage waste by preliminary digesting the raw waste material, preferably in primary and secondary digesting steps, passing the resulting liquid with fine solids therein in sequence and in controlled consecutive order to a series of settling tanks, subjecting the liquid effluents therefrom to a simultaneous aeration-ultra violet ray sterilization treatment, and removing the water effluent therefrom as re-usable water. New and novel aeration-irradiation treatment units are disclosed which provide a novel, very efficient system for effecting the elimination of sewage waste in areas where sewers are not available or where land type and quality prevent the use of present day systems for the disposal of said wastes and producing useable water therefrom.

3,825,495
LUBRICANT FOR CONTROLLED-SLIP DIFFERENTIAL

Thomas D. Newingham, Broomall, and Alexander D. Recchuite, Boothwyn, Pa., John Q. Griffith III, Claymont, Del., and Marcus W. Haseltine, Jr., Brookhaven, Pa., assignors to Sun Research and Development Co., Philadelphia, Pa.

Filed Feb. 19, 1971, Ser. No. 116,985

Int. Cl. C10m *1/48, 1/38*

U.S. Cl. 252—32.7 E **11 Claims**

An improved method of lubrication of a controlled-slip differential comprises using a lubricant comprising (A) synthetic sulfurized oil consisting essentially of a sulfurized blend of lard oil and a C_{12}–C_{24} monoolefin and (B) a hydrocarbon base stock having a kinematic viscosity at 210° F. in the range of 1.5–200.0 cs. and containing a blend of at least one C_{12}–C_{29} naphthene and from 0.1–20 parts by weight, based on said naphthene of at least one member from at least one of the following groups (a), (b), (c) and (d):

(a) a synthetic liquid C_3–C_4 olefin homopolymer copolymer, or terpolymer;
(b) a member from group (a) above which is at least partially hydrogenated;
(c) a severely hydrorefined naphthenic lube containing less than 1% of gel aromatic hydrocarbons; and
(d) a severely hydrorefined paraffinic lube containing less than 1% of gel aromatic hydrocarbons;

and wherein the amount of said blend which is present in said base stock is sufficient to provide a greater coefficient of traction, measured at 600 ft./min., 200° F., 400,000 p.s.i., than would be provided by substitution of the same amount of ASTM Oil No. 3 for said blend in said base stock and wherein said lubricant contains 0.5–10 volumes of synthetic sulfurized oil for each 100 volumes of said base stock. The preferred lubricant also contains an extreme pressure additive (e.g. tricresyl phosphate) and an additive which lowers the static friction of the lubricant (e.g. a surface-active, organic phosphate ester of a linear aliphatic, ethoxylated alcohol).

3,825,496
ORGANIC COMPOSITIONS CONTAINING SYNERGISTIC ANTIOXIDANT MIXTURES

Milton Braid, Westmont, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

No Drawing. Filed May 18, 1973, Ser. No. 361,725

Int. Cl. C10m *1/38*

U.S. Cl. 252—48.2 **18 Claims**

Organic compositions, normally susceptible to oxidative deterioration, containing, in an amount sufficient to increase oxidation resistance, a synergistic mixture of 1-n-butoxy-1-(1-naphthoxy) ethane and a co-antioxidant selected from the group consisting of t-nonylpolysulfide, phenylthiobenzoquinone and dioctyldiphenylamine.

3,825,497
HYDRAULIC FLUIDS

Robert Alan Cameron Ker, London, England, assignor to Castrol Limited, London, England

No Drawing. Continuation of abandoned application Ser. No. 33,881, May 1, 1970. This application Apr. 28, 1972, Ser. No. 248,774

Int. Cl. C09k *3/00*

U.S. Cl. 252—79 **5 Claims**

An improved hydraulic fluid is provided, which comprises a combination of two esters; one being a di (oxyalkene) or di (polyoxyalkene) ester of a dibasic carboxylic acid, e.g. in amounts of 30% to 60% by weight; and the other being an ester of a diol, particularly a glycol, and a monobasic carboxylic acid, e.g. in amounts of 25% to 55% by weight.

3,825,498
DISHWASHING DETERGENT COMPOSITION FOR USE IN DISHWASHING MACHINES

Theodor Altenschopfer, Dusseldorf-Holthausen, and Heimold Batka, Dusseldorf-Reisholz, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

No Drawing. Filed Jan. 13, 1972, Ser. No. 217,649

Claims priority, application Germany, Jan. 14, 1971, P 21 01 508.7

Int. Cl. C11d *7/54*

U.S. Cl. 252—99 **18 Claims**

A dishwashing detergent composition for use in dishwashing machines, said composition consisting essentially of (a) about 90%–5% by weight of a water soluble alkali silicate, and (b) about 5%–90% by weight of a polyhydroxycarboxylic acid containing carboxyl or carboxylate groups and hydroxyl groups, as well as specified polymer units. The composition can contain various other ingredients.

3,825,499
FUELED MODERATOR COMPOSITION

Peter D. Johnson, Chatsworth, Calif., assignor to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed July 7, 1959, Ser. No. 825,611

Int. Cl. G21c *21/00*

U.S. Cl. 252—301.1 R **18 Claims**

8. A method of preparing a UO_2—BeO ceramic composition, which comprises forming an aqueous solution of beryllium and uranyl salts, the anion of said salts being selected from the group consisting of sulfate and nitrate, contacting the resulting solution with a solution of ammonium hydroxide, thereby coprecipitating beryllium and uranium hydrous oxides, separating the resulting precipitate from the resulting solution, calcining the resulting precipitate to yield a beryllium and uranium oxide composition, and then hot pressing the resulting oxide composition to yield a UO_2—BeO ceramic body.

3,825,500
NEODYMIUM GLASS LASER HAVING ROOM TEMPERATURE OUTPUT AT WAVELENGTHS SHORTER THAN 1060 NM

Robert R. Shaw and Charles C. Robinson, Sturbridge, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Original application Mar. 10, 1971, Ser. No. 122,723, now Patent No. 3,714,059. Divided and this application Aug. 31, 1972, Ser. No. 285,262

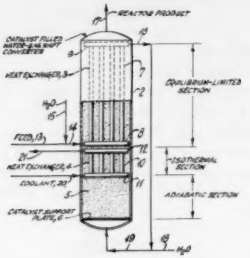
Int. Cl. C03c *3/12, 3/28;* **C09k** *1/04*

U.S. Cl. 252—301.4 F **4 Claims**

Laserable material doped with a quantity of neodymium ions in a low concentration which results in the glass exhibiting a ratio of fluorescent intensity peaked at 920 nanometers over the fluorescent intensity peaked at approximately 1060 nanometers of at least .4 as measured by a Cary Model 14 spectrophotometer. The glasses enable the generation of laser light in a waveband with an optical center at about 920 nanometers at room temperature (approximately 20° C.) when positioned in a laser cavity which is resonant at 920 nanometers. Four such laserable glasses are given below in weight percent:

Cs_2O	68.9	69.1	52.4	61.6
Nd_2O_3	2.0	3.0	2.0	3.0
TiO_2	29.1			
B_2O_3		27.9		35.4
GeO_2			45.6	

3,825,501
EXOTHERMIC REACTION PROCESS
James R. Muenger, Beacon, N.Y., assignor to Texaco Inc., New York, N.Y.
Continuation-in-part of application Ser. No. 880,254, Nov. 26, 1969, now Patent No. 3,666,682. This application Dec. 17, 1971, Ser. No. 209,238
The portion of the term of the patent subsequent to May 30, 1989, has been disclaimed
Int. Cl. C01b 2/06
U.S. Cl. 252—373 6 Claims



A stream of fluid reactants is passed through catalyst wherein the reactants undergo a temperature controlled exothermic reaction so as to produce maximum conversion. The temperature of the reacting stream is controlled by two separate streams of coolants which are separately passed through two separate heat exchangers embedded in said catalyst in concurrent flow and indirect heat exchange with the reacting stream. The first stream of coolant may be water or an organic liquid from an external source. The second stream of coolant is a portion of unreacted feedstream before it is introduced into the catalyst where it undergoes exothermic reaction as previously described.

3,825,502
OLEFIN OXIDATION CATALYST
Shigeo Takenaka, Hitoshi Shimizu, and Kenichiro Yamamoto, Takasaki, Japan, assignors to Nippon Kayaku Co., Ltd., Tokyo, Japan
No Drawing. Filed Jan. 20, 1972, Ser. No. 219,558
Claims priority, application Japan, May 26, 1971, 46/35,501
Int. Cl. B01j 11/06, 11/32
U.S. Cl. 252—456 5 Claims

The present invention relates to a novel catalyst corresponding to the empirical formula:

$$Ni_aCo_bFe_cBi_dMe_eH_hMo_fO_g$$

wherein Me represents at least one element selected from the group of tin, magnesium, chromium, zinc, manganese titanium and tungsten, H represents at least one element selected from the group of potassium, rubidium and cesium, and *a*, *b*, *c*, *d*, *e*, *f*, *g* and *h* are numbers of atoms of Ni, Co, Fe, Bi, Me, Mo, O and H respectively, if more than two elements are preferred in the case of Me and H, *e* and *h* mean the total numbers of those elements, with the proviso that when *f* is 12, *a* is 0 to 6, *b* is 0 to 20, *c* is 0.5 to 8, *d* is 0.1 to 7, *e* is less than 3.0 excluding zero, *h* is more than 0 and no more than 0.5, and *g* is a number which is determined by the valence requirements of Ni, Co, Fe, Bi, Me, H, and Mo. *g* is about 36 to 90. The catalyst of the invention is useful in oxidation of olefins, and in particular in the production of methacrolein or 1,3-butadiene and methacrolein simultaneously by the oxidation of olefin consisting of isobutylene or butene mixture containing isobutylene and n-butenes with molecular oxygen or air.

According to the present invention, the catalysts employed in a vapor phase oxidation increase the yield of methacrolein without excessive oxidation of olefins to undesired higher oxidation products of carbon such as carbon monoxide and carbon dioxide.

3,825,503
HYDROGEN TRANSFER CATALYST
Ralph E. Patrick, Flatwoods, and Ronald A. Kmecak and Stephen M. Kovach, Ashland, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.
No Drawing. Original application Oct. 22, 1968, Ser. No. 769,737, now Patent No. 3,686,340. Divided and this application June 15, 1972, Ser. No. 263,216
Int. Cl. B01j 11/08, 11/22
U.S. Cl. 252—462 3 Claims

A novel catalyst system including an active metal oxide selected from the group consisting of noble metals and nickel; a promoter selected from the group consisting of tin and lead; if desired, a second promoter selected from the group consisting of alkali metals, such as potassium, rubidium, cesium, etc., an alkaline earth metal, such as calcium, strontium, barium, etc., and a rare earth metal, such as cerium, thorium, etc.; and an inert oxide support, such as alumina. The subject catalysts are utilized in the hydrodealkylation of alkyl aromatics, etc., in the dehydrogenation of paraffins and the like, and in the dehydrogenation-desulfurization of sulfur- and nitrogen-contaminated hydrocarbon materials.

3,825,504
HYDROCARBON HYDROPROCESSING CATALYST
Lee Hilfman, Mount Prospect, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Filed Jan. 27, 1972, Ser. No. 221,450
Int. Cl. B01j 11/06, 11/08, 11/32
U.S. Cl. 252—464 7 Claims

A hydroprocessing catalyst of an alumina-containing carrier material, a nickel component and a Group V–B metallic component. The catalyst is prepared via coextrusion which inhibits the formation of nickel aluminate to the extent that less than about 0.1% thereof appears in the final catalytic composite.

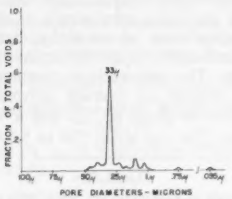
3,825,505
HYDROCARBON HYDROPROCESSING CATALYST
Lee Hilfman, Mount Prospect, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Filed Jan. 21, 1972, Ser. No. 219,844
Int. Cl. B01j 11/08, 11/22
U.S. Cl. 252—466 J 3 Claims

A hydroprocessing catalyst of an alumina-containing carrier material, a nickel component and an iron component. The catalyst is prepared via coextrusion which inhibits the formation of nickel aluminate to the extent that less than about 0.1% thereof appears in the final catalytic composite.

3,825,506
METHOD OF PREPARATION OF A POROUS THERMOSETTING RESIN
Edward W. Carter, Kennesaw, Ga., assignor to Glasrock Products, Inc., Atlanta, Ga.
Continuation-in-part of abandoned application Ser. No. 221,028, Jan. 26, 1972. This application Apr. 13, 1973, Ser. No. 350,960
Int. Cl. C08g 53/08
U.S. Cl. 260—2.5 L 21 Claims

Porous open-cell thermosetting resin and process for preparing same. The process involves the initial formation of an emulsion having a liquid resin blend as the continu-

ous phase and a hardener solution or dispersion as the discontinuous phase. The resin blend phase initially contains an amount of hardener less than that required for a stoichiometric cure of the resin. The hardener solution or dispersion initially contains an additional amount of hardener to supplement the blend and cure the resin. The liquid of the non-resin phase is selected to be substantially a non-solvent with respect to the resin. As the polymerization of the emulsion proceeds hardener is leached out of the solution phase which is the discontinuous phase,



resulting in a phase inversion after partial gelation with the non-resin liquid solution phase becoming the continuous phase and the non-gelled resin blend becoming the discontinuous phase. After polymerization is completed and the resin solidified, the liquid of the non-resin phase is removed by extraction or evaporation. The result is a resin having a network of interconnected pores. An important aspect of the invention is that it permits control of the pore size of the product.

3,825,507

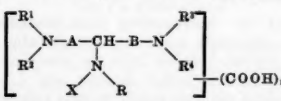
LEUCAURAMINE DERIVATIVES

Violet Boyd, Ronald Arthur Evans, Kenneth Anthony Holt, and Andrew Hunter Morris Renfrew, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

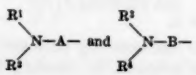
No Drawing. Filed Sept. 1, 1971, Ser. No. 177,109
Claims priority, application Great Britain, Sept. 4, 1970, 42,533/70; Dec. 16, 1970, 59,715/70; July 26, 1971, 34,955/71

Int. Cl. C07c *101/42*
U.S. Cl. 260—518 R **1 Claim**

A leucauramine compound of the general formula:



wherein A and B each independently represents an optionally substituted 1,4-arylene residue; R represents hydrogen, hydroxyl, alkoxy or an optionally substituted amino, alkyl, aralkyl or cycloalkyl radical; X represents hydrogen or an optionally substituted hydrocarbon radical which may contain one or more hetero atoms, or R and X together with the attached nitrogen atom form an optionally substituted heterocyclic ring; each of R^1, R^2, R^3 and R^4 independently represents hydrogen or an optionally substituted alkyl, aralkyl, cycloalkyl or aryl radical or forms part of a divalent organic chain which together with the attached nitrogen atom constitutes a heterocyclic ring and n has a value of 1, 2 or 3 provided that when R is hydrogen and each of



is 4-dimethylaminophenyl, X is not 2- or 4-carboxyphenyl.

The compounds are suitable for use in the production of clean-to-handle carbon papers useful in a spirit-reproducing process.

3,825,508

PRODUCTION OF POLYAMIDE FROM METHYL SUBSTITUTED PHTHALIC ACID BY MELT POLYMERIZATION IN THE PRESENCE OF REDUCING PHOSPHORUS ACID COMPOUND

Takao Ashida and Osamu Kurihara, Iwakuni, Kiyoshi Nawata and Takanori Shinoki, Tokyo, and Yutaka Fujita, Gentaro Yamashita, and Noritsugu Saiki, Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

No Drawing. Filed May 4, 1972, Ser. No. 250,244

Int. Cl. C08g *20/20*
U.S. Cl. 260—78 R **6 Claims**

A melt-polymerized polyamide composition derived from 85 to 100 mol percent in total of a diamine and a methyl-substituted phthalic acid selected from the group consisting of methylterephthalic acid and methylisophthalic acid, 15 to 0 mol percent of a comonomer selected from the group consisting of dicarboxylic acids other than the methyl-substituted phthalic acid, aminocarboxylic acids and lactams thereof, and a reducing phosphorus acid compound.

3,825,509

INITIATOR EMULSION FOR OLEFINIC POLYMERIZATION REACTIONS

Richard K. Miller, Long Beach, Calif., assignor to The B. F. Goodrich Company, New York, N.Y.

No Drawing. Filed Nov. 13, 1972, Ser. No. 305,855

Int. Cl. C08f *3/30, 15/02, 15/06*
U.S. Cl. 260—86.3 **7 Claims**

A free-radical initiator emulsion for use in olefinic polymerization reactions comprising an emulsion of said initiator in a water solution of polyoxyethylene sorbitan monolaurate and polyvinyl alcohol and the process of producing polymers employing said emulsion.

3,825,510

METHOD FOR CROSS-LINKING COPOLYMERS OF TETRAFLUOROETHYLENE AND PROPYLENE

Takashi Yamamoto and Katsuo Uchijima, Yokohama, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

No Drawing. Filed Dec. 13, 1971, Ser. No. 207,613

Claims priority, application Japan, Dec. 30, 1970, 46/122,837

Int. Cl. C08f *27/00*
U.S. Cl. 260—87.5 B **12 Claims**

A cross-linked copolymer of tetrafluoroethylene and propylene is produced by heating a copolymer of tetrafluoroethylene and propylene in the presence of an organic di-peroxy compound as cross-linking agent.

3,825,511

ELECTROCONDUCTIVE RESINS AND PROCESS OF PREPARATION

Albert H. Markhart, Wilbraham, and James O. Santer, East Longmeadow, Mass., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed May 15, 1972, Ser. No. 253,016

Int. Cl. C08f *15/02, 3/32*
U.S. Cl. 260—87.5 R **12 Claims**

Electroconductive cationic resins prepared by the reaction of a 1,4-dihaloalkene-2 compound and a di(tertiary

amine). The resins are quaternary ammonium compounds. They may be prepared in aqueous medium. They have utility in providing electroconductivity to sheet materials used in electrographic printing.

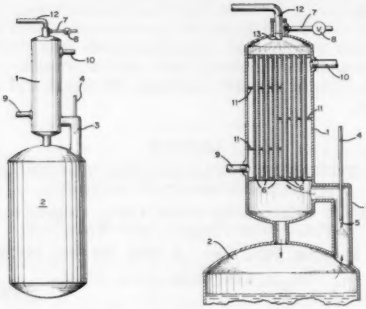
3,825,512

PROCESS FOR POLYMERIZING VINYL CHLORIDE USING A REFLUX CONDENSER

William M. Reiter, Mendham, James E. Cooper, Dover, and Krishnakant K. Sheth, West Caldwell, N.J., assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan, and Universal PVC Resins, Inc., Painesville, Ohio, fractional part interest to each

Continuation-in-part of abandoned application Ser. No. 222,975, Feb. 2, 1972. This application Sept. 11, 1972, Ser. No. 288,176

Int. Cl. C08f *1/11*
U.S. Cl. 260—92.8 W **11 Claims**



This invention provides an improved process for polymerizing vinyl chloride in an aqueous medium using a reflux condenser. The improvement comprises (1) during the condensation period spraying a coating of water on the inner surfaces of the condenser to inhibit the formation thereon of polymerized vinyl chloride particles, and (2) spraying water in the path of and in a direction counter-current to the flow of vinyl chloride vapor as it progresses from the reactor to within the condenser thereby to assist in condensing the vinyl chloride for return to the reactor. The spray may include a defoamer to reduce the tendency of carryover of polymer into the condenser tubes.

3,825,513

EMULSION BASES AND EMULSIONS

Fritz S. Rostler, Berkeley, Calif., assignor to Phillips Petroleum Company, Bartlesville, Okla.

No Drawing. Continuation-in-part of applications Ser. No. 690,572, Dec. 14, 1967, now abandoned, Ser. No. 773,186, Nov. 4, 1968, and Ser. No. 714,424, Mar. 20, 1968, now Patent No. 3,577,250. This application Feb. 18, 1971, Ser. No. 116,685

Int. Cl. C08f *45/52;* **E01c** *7/36*
U.S. Cl. 260—28.5 AS **7 Claims**

Emulsions suitable for the bonding of aggregates containing as their non-aqueous oil phase either a solution of a poly(styrene)-poly(diene)-poly(styrene) block copolymer in which the solvent may be a petroleum oil substantially of the composition of ASTM Extender Oils 101 or 102 diluted with a volatile solvent, or an asphalt solution, and also mixtures of such emulsions containing the two phases.

3,825,514

FILM FORMING HYDROPHILIC AMIDE POLYMER COMPOSITIONS

Raymond L. Drury, Jr., James W. Hines, and Charles S. Nevin, Decatur, Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

No Drawing. Filed Oct. 12, 1971, Ser. No. 188,587

Int. Cl. C08f *29/46, 45/67*
U.S. Cl. 260—29.6 TA **31 Claims**

Hydrophilic amide polymers are obtained by interpolymerizing monomers of an ethylenically unsaturated monocarboxylic acid, ethylenically unsaturated hard monomers of the lower alkyl esters of an acrylic acid and a soft alkyl ester of an alpha, beta-ethylenically unsaturated carboxylic acid and acylating with hydrophilic amines. The polymerized monomeric units are sufficient to provide an average polymer Tg ranging from about 35° to about 45° C. and a weight average molecular size ($\overline{A}w$) of about 500 to 5,000.

3,825,515

PROCESS FOR IMPROVING THE PROPERTY PROFILE OF RUBBER-POLYMER SYSTEMS

Howard Robert Lucas, Danbury, and Robert Nils Olsen, Norwalk, Conn., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed June 13, 1973, Ser. No. 369,662

Int. Cl. C08f *45/40*
U.S. Cl. 260—31.8 M **11 Claims**

The incorporation of a dialkyl phthalate into rubber-polymer composition components before the blending, devolatilization and extrusion thereof has been found to improve the property profile of the resultant systems.

3,825,516

GLASS FIBER-REINFORCED, TEREPHTHALIC ACID-CONTAINING POLYAMIDE MOLDING COMPOUNDS

Johannes Schneider and Wolfgang Pungs, Troisdorf, Germany, assignors to Dynamit Nobel AG, Troisdorf, Germany

Filed Nov. 29, 1972, Ser. No. 310,493

Claims priority, application Germany, Dec. 14, 1971, P 21 61 908.9

Int. Cl. C08g *51/10*
U.S. Cl. 260—37 N **10 Claims**

A method for incorporating glass particles into an amorphous polyamide containing terephthalic acid radicals and a polymer selected from the group consisting of 2,2,4-trimethylhexamethylene diamine and 2,4,4-trimethylhexamethylene diamine which process comprises introducing said polyamide and said glass particles into a zone and kneading them together, preferably by employing a screw extruder such as a double screw extruder until the glass particles are intimately incorporated within and distributed throughout said polyamide.

3,825,517

THERMOSETTING POLYESTER MOLDING COMPOSITIONS AND METHOD OF PREPARATION

Bartholomew M. Ficarra, Upper Saddle River, N.J., assignor to Reichhold Chemicals, Inc., White Plains, N.Y.

No Drawing. Filed May 25, 1972, Ser. No. 256,848

Int. Cl. C08g *51/04*
U.S. Cl. 260—40 R **23 Claims**

Polymerizable, thermosetting polyester molding compositions may be prepared by blending together (I) an

unsaturated polyester resin and, as the sole crosslinking agent (II) a vinyl ester prepared from an epoxy resin having a melt point up to 100° C. and a vinyl acid, and (III) a polymerization initiator and passing said blend through a plastics extruder at a temperature below the decomposition temperature of the polymerization initiator and pelletizing the product. These solid precatalyzed molding compositions may then be molded into thermoset articles exhibiting high heat distortion and excellent mechanical properties.

3,825,518

DENTAL FILLING MATERIALS

John Foster, Sheerness, and Richard John Walker, Harpenden, England, assignors to The Amalgamated Dental Company Limited, London, England

No Drawing. Filed Mar. 14, 1973, Ser. No. 341,106

Claims priority, application Great Britain, Mar. 15, 1972, 12,134/72

Int. Cl. A61k *5/00;* **C08f** *45/04*

U.S. Cl. 260—42.52 **6 Claims**

A composite dental filling material comprises a mixture of a finely divided, inert inorganic filler and the reaction product of an organic diisocyanate, preferably an aliphatic diisocyanate, and a hydroxyalkyl acrylate or methacrylate. The filling material may also contain one or more other ethylenically unsaturated monomer especially polyunsaturated cross-linking monomers. Further the filling material may also contain a catalyst and an activator and the invention also provides a two-part package for the preparation of such a material comprising two parts which together, contain monomer (namely the reaction product of the organic diisocyanate and the hydroxyalkyl acrylate or methacrylate, optionally together with other ethylenically unsaturated monomers), inert filler, catalyst and activator; neither of the parts of the package containing both catalyst and activator.

3,825,519

MOLDING COMPOSITION CONTAINING POLYETHYLENE AND CEMENT

Naohiro Murayama and Makoto Fukuda, Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed Aug. 11, 1972, Ser. No. 279,838

Claims priority, application Japan, Aug. 12, 1971, 46/60,635

Int. Cl. C08f *45/04*

U.S. Cl. 260—42.13 **8 Claims**

A molding composition containing polyethylene and a cement selected from the group: portland cements, alumina cements, magnesia cements, and silica cements. Preparation is by adding the cement to a polyethylene melt and kneading or by mixing the cement with a polyethylene powder and kneading at a temperature above the melting point of the polyethylene.

3,825,520

SMOKE-RETARDANT STYRENE POLYMER COMPOSITIONS CONTAINING A METAL PHTHALOCYANINE

Leo P. Parts, Dayton, and John T. Miller, Jr., West Carrollton, Ohio, assignors to Monsanto Research Corporation, St. Louis, Mo.

No Drawing. Filed Dec. 29, 1972, Ser. No. 319,963

Int. Cl. C08f *45/62*

U.S. Cl. 260—45.75 R **1 Claim**

Smoke-retardant polymer compositions comprising a styrene polymer and at least a sufficient amount of an iron, copper, manganese, vanadyl or cobalt phthalocyanine to reduce smoking.

3,825,521

MANGANESE AMINE CHELATE CATALYZED AROMATIC POLYETHER FORMATION

Shinichi Izawa, Tokyo, Kazuhiko Harada, Kanagawa, Ken Mizushiro and Miyoko Ishihara, Tokyo, and Atsuo Nakanishi, Kanagawa, Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

No Drawing. Filed July 25, 1972, Ser. No. 275,102

Claims priority, application Japan, July 31, 1971, 46/57,139, 46/57,140; Aug. 14, 1971, 46/61,419

Int. Cl. C08g *23/18*

U.S. Cl. 260—47 ET **28 Claims**

Aromatic polyethers e.g. poly(2,6-dimethylphenylene-1,4-ether) which are useful as engineering polymers are produced in pure state by oxidative polymerization of a 2,6-disubstituted phenol at 0–100° C. in the presence of a chelate type catalyst comprising at least one of divalent manganese salts and at least one selected amino compound.

3,825,522

PROCESS FOR THE PREPARATION OF SELF-EXTINGUISHING EPOXY RESINS

Silvio Vargiu, Sesto San Giovanni, and Mario Pitzalis, Arcore, Italy, assignors to Società Italiana Resine S.I.R. S.p.A., Milan, Italy

No Drawing. Filed Dec. 11, 1972, Ser. No. 313,904

Claims priority, application Italy, Dec. 27, 1971, 32,946/71

Int. Cl. C08g *30/04*

U.S. Cl. 260—47 EP **12 Claims**

Solid and self-extinguishing epoxy resins having high epoxy equivalent values and which produce solutions having low viscosity levels, are prepared by a process which consists essentially in reacting bisphenol A with an intermediate epoxy product obtained by dehydrochlorinating the products of reaction between epichlorohydrin and hydroxylated derivatives of halogenated diphenyls or diphenyl methanes.

3,825,523

POLYMER COMPOSITION STABILIZED AGAINST OXIDATION AND LIGHT

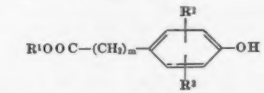
Tadao Iwata, Motoyasu Yasawa, and Juntaro Sasaki, Iwakuni, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

No Drawing. Filed Apr. 19, 1971, Ser. No. 135,374

Int. Cl. C08f *27/00, 27/06, 27/12*

U.S. Cl. 260—47 UP **6 Claims**

An olefin polymer composition stabilized against oxidation and light is prepared by reacting a copolymer of an olefin and an ethylenically unsaturated alcohol with a phenol derivative of the formula



and/or an organo-sulfur compound of the formula

$$R^4OOC—Z^2—S—R^5.$$

The composition is used as such or as blend with an olefin polymer.

3,825,524

PROCESS FOR POLYMERIZATION OF OLEFINS AND CATALYSTS THEREFOR

Shigeru Wada, Otake, Hidesaburo Oi, Yamaguchi, Norio Matsuzawa, and Hiroshi Nishimura, Otake, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

No Drawing. Filed Sept. 30, 1971, Ser. No. 185,442
Claims priority, application Japan, Oct. 2, 1970, 45/85,932
Int. Cl. B01j *11/84*; C08f *1/56, 3/10*
U.S. Cl. 260—93.5 S 10 Claims

A process for the polymerization of olefins which comprises polymerizing or copolymerizing olefins in the presence of a catalyst consisting essentially of:

(A) a titanium trichloride composition obtained by extracting a crude titanium trichloride composition including an aluminum-containing inorganic substance, such crude titanium trichloride composition being prepared by reducing titanium tetrachloride with an organoaluminum chloride expressed by the following formula.

$$R_{3-n}AlCl_n$$

wherein R is an alkyl group of 1–6 carbon atoms or an aryl group, and n is a positive number greater than 0 (zero) but smaller than 3,

with a mixed solvent composed of (i) a main solvent selected from the group consisting of saturated aliphatic hydrocarbons, aromatic hydrocarbons, halogenated aromatic hydrocarbons, trichloroethylene and carbon disulfide and (ii) an auxiliary solvent selected from the group consisting of oxygen-containing organic compounds, nitrogen-containing organic compounds, silicon-containing organic compounds and thioethers, and separating the titanim trichloride composition from the extract; and

(B) an organoaluminum compound.

3,825,525

ALLERGENS REACTED WITH CARBODIIMIDES

Noel Austin Mullan and Brian George Overell, Dorking, England, assignors to Beecham Group Limited, Brentford, Middlesex, England

No Drawing. Original application July 30, 1970, Ser. No. 59,745. Divided and this application July 20, 1973, Ser. No. 381,172
Claims priority, application Great Britain, Aug. 6, 1969, 39,289/69; May 15, 1970, 23,621/70; May 16, 1970, 23,853/70
Int. Cl. A61k *23/00*; C07g *7/00*
U.S. Cl. 260—112 R 21 Claims

Desensitizing or immunizing agents are provided for treating hypersensitive or allergic conditions. Modified allergenic ma•erial is prepared comprising an allergenic protein or glycoprotein crosslinked intermolecularly or intramolecularly with an inorganic cyanate. The modified material has reduced allergenicity relative to the uncrosslinked allergen and has the ability to produce antibodies having cross-specificity for the uncrosslinked allergenic protein or glycoprotein.

3,825,526

METHOD FOR FRACTIONATION

Kaj G. Forss, Vesakkotie 6B, Helsinki 63, Finland, and Ilpo M. J. Pirhonen, Rinnetie B21, Mankkaa, Finland

Filed Aug. 13, 1971, Ser. No. 171,704
Claims priority, application Finland, Aug. 14, 1970, 2,238/70
Int. Cl. C07g *1/00*
U.S. Cl. 260—124 R 12 Claims

The present invention relates to a method for the fractionation of lignosulphonic acids by extraction with amine-alcohol wherein butanol and dodecylamine are preferred.

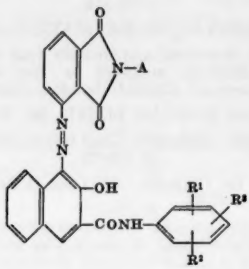
3,825,527

AZO DYE OF A 3-AMINOPHTHALIMIDE AND CONTAINING CARBAMOYL MOIETIES

Guenther Ruider, Frankenthal, and Peter Dimroth, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Dec. 2, 1971, Ser. No. 204,315
Int. Cl. C09b *29/00, 29/20*; D06p *1/44*
U.S. Cl. 260—152 3 Claims

This invention is directed to monoazo pigments of the formula of



(I)

in which R^1 denotes carbamoyl among other possible constituents; R^2 and R^3 denote hydrogen or chlorine among other possible constituents; and A denotes phenyl among other constituents. The pigments generally have red shades and are eminently suitable for example for coloring lacquers, resins and printing inks.

3,825,528

CRYSTALLINE KANAMYCIN TETRAHYDROCHLORIDE

John Edward Vogan and Edmund Stanley Granatek, Syracuse, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Aug. 20, 1970, Ser. No. 65,686
Int. Cl. C07c *12/18*
U.S. Cl. 260—210 K 1 Claim

The specification discloses the preparation of crystalline forms of the mono-, di-, tri-, and tetrahydrochloride salts of kanamycin and therapeutic composition thereof.

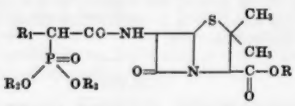
3,825,529

α-PHOSPHONOACETYLPENICILLINS

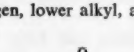
Joseph Edward Dolfini, North Brunswick, N.J., and Hermann Breuer, Burgweinting, Germany, assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

No Drawing. Filed Feb. 22, 1971, Ser. No. 117,730
Int. Cl. C07d *99/16*
U.S. Cl. 260—239.1 11 Claims

α-Phosphonoacetylpenicillins of the general formula



wherein R is hydrogen, lower alkyl, aralkyl, a salt forming ion or the group



R_1 is hydrogen, lower alkyl, aralkyl, aryl or a heterocyclic group; R_2 and R_3 each is hydrogen, a salt forming ion, lower alkyl, aryl or aralkyl; and R_4 is lower alkyl, aryl or aralkyl, are useful as anti-bacterial agents.

3,825,530

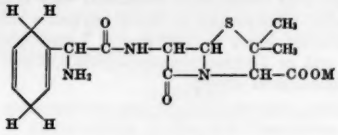
PROCESS FOR PREPARING α-AMINO-CYCLOHEXADIENYLALKYLENE PENICILLINS

Manmohan S. Atwal, Somerset, and Eugene R. Shipkowski, Freehold, N.J., assignors to E. R. Squibb & Sons Inc., Princeton, N.J.

No Drawing. Continuation-in-part of abandoned application Ser. No. 23,505, Mar. 27, 1970. This application Nov. 18, 1971, Ser. No. 200,147

Int. Cl. C07d *99/16*
U.S. Cl. 260—239.1 7 Claims

The present invention is directed to a method for preparing α-amino-cyclohexadienylalkylene penicillin compounds of the formula



wherein M is an alkali metal, an ammonium ion, or a substituted ammonium ion.

These compounds may be prepared by reacting α-amino-cyclohexadienylmethylene penicillin, hereafter referred to as epicillin, with an alkali metal alkanoate or ammonium alkanoate, or by reacting epicillin with an alkali metal hydroxide or ammonium hydroxide, or by reacting epicillin with an alkali metal alkoxide or ammonium alkoxide, or by reacting epicillin with an amine salt. The reaction to form the alkali metal salt takes place in the presence of sufficient water to form the monohydrate of epicillin without substantially exceeding this amount of water.

3,825,531

PROCESS FOR PRODUCING PENICILLIN DERIVATIVES

Toshiyasu Ishimaru, Suita, and Yutaka Kodama, Toyama, Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan

No Drawing. Filed June 28, 1972, Ser. No. 267,081

Claims priority, application Japan, July 8, 1971, 46/50,446

Int. Cl. C07d *99/16*
U.S. Cl. 260—239.1 5 Claims

Penicillin or penicillin sulfoxide esters are prepared in an industrially advantageous manner, by reacting an N,N-disubstituted-acid amide with a chloroformate, and then reacting the imino ether salt thus obtained with the salt of a penicillin or a penicillin sulfoxide.

3,825,532

PROCESS FOR THE PREPARATION OF OMEGA LAURINOLACTAME

Rene Kern, Savigny-sur-Orge, Claude Poulain, Orsay, and Francois Tock, Palaiseau, France, assignors to Societe Anonyme dite: Aquitaine Total Organico, Courbevole, France

No Drawing. Filed Oct. 26, 1971, Ser. No. 192,327

Claims priority, application France, Oct. 28, 1970, 7038817

Int. Cl. C07d *41/00*
U.S. Cl. 260—239.3 A 4 Claims

A process for rearranging cyclododecanoneoxime into pure cyclododecalactame, characterized by the fact that the oxime, converted into oxime chlorhydrate, is made into a solution with a selective solvent, in the presence of a small quantity of catalyst, chosen from the group of acid halides and oxyhalides, and then heated to a temperature of between 65 and 110° C. for one to two hours, the resulting hydrochloric acid is drawn off by means of a flow of gas while maintaining the reflux temperature of the solvent, the reaction mixture is washed while hot with an alkaline aqueous solution, the organic phase containing the lactame is washed in hot water until it becomes neutral, and the lactame is recovered by crystallization or distillation of the solvent.

The quantity of catalyst used ranges from 0.5 to 5%, and preferably 1 to 2%, of the weight of oxime.

The solvent is preferably selected from alkanes, cycloalkanes, substituted alkane and cycloalkane derivatives, and halogenated alkane and cycloalkane derivatives.

3,825,533

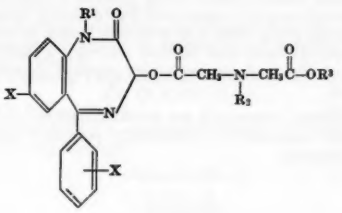
N-CARBOXYMETHYL - N - SUBSTITUTED GLYCINATE ESTERS OF 3-HYDROXY-1,4-BENZODIAZEPIN-2-ONES

Abraham Nudelman, Bala Cynwyd, and Ronald J. McCaully, Malvern, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Mar. 20, 1972, Ser. No. 236,174

Int. Cl. C07d *53/06*
U.S. Cl. 260—239.3 D 4 Claims

This invention is directed toward novel central nervous system depressants of the formula:



wherein

R^1 is a member selected from the group consisting of the hydrogen, lower alkyl, benzyl and lower alkoxyalkyl radicals;

R^2 is a member selected from the group consisting of the lower alkyl, phenyl and benzyl radicals;

R^3 is a member selected from the group consisting of hydrogen, an alkali metal cation, an alkaline earth metal cation, the ammonium cation, a tri(lower)alkyl ammonium cation, the pyridinum ion, a lower alkyl radical and an aralkyl radical of 7 to 9 carbon atoms;

X is a member selected from the group consisting of the halo, cyano, trifluoromethyl, nitro and lower alkylthio radicals;

Y is a member selected from the group consisting of the hydrogen, halo, trifluoromethyl, nitro and lower alkylthio radicals; and the pharmaceutically acceptable N-acid addition salts thereof. This invention also provides methods for the preparation of the central nervous system depressant compounds and their administration as well as the compositions for administration which contain the active compounds of this invention.

3,825,534

STYRYL COMPOUNDS, PROCESSES FOR THEIR MANUFACTURE AND THEIR USE

Kurt Weber, Basel, and Christian Luethi, Muenchenstein, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

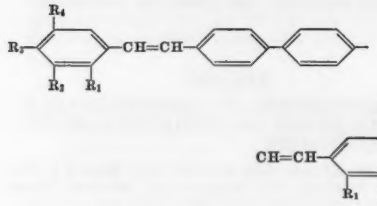
No Drawing. Filed July 19, 1971, Ser. No. 164,051

Claims priority, application Switzerland, July 23, 1970, 11,171/70

Int. Cl. C09b *23/00*

U.S. Cl. 260—240 CA 5 Claims

The invention provides new fluorescent compounds of the formula



wherein either

(a) one, two or three of the symbols R_1, R_2, R_3 or R_4 represent halogen atoms of the group fluorine, chlorine or bromine, whilst the remainder of these symbols denote hydrogen, or

(b) one or two of the symbols R_1, R_2, R_3 or R_4 represent a halogen atom of the group fluorine, chlorine or bromine, whilst another of the symbols R_1, R_2, R_3 or R_4 denotes an alkyl group with 1 to 4 carbon atoms or an alkoxy group with 1 to 4 carbon atoms, or two of the symbols mentioned together represent a methylene dioxy group, and the remaining symbols denote hydrogen.

The defined compounds are valuable optical brightening agents especially for polyamides polyvinyl chloride and polystyrene.

3,825,535

HYDRAZINES, HYDRAZIDES AND HYDRAZONES OF ISOXAZOLOPYRIDINE CARBOXYLIC ACIDS AND ESTERS

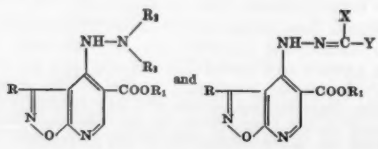
Theodor Denzel, Nuremberg, and Hans Hoehn, Tegernheim, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

No Drawing. Original application Mar. 29, 1971, Ser. No. 129,200, now Patent No. 3,736,325, dated May 29, 1973. Divided and this application Mar. 5, 1973, Ser. No. 337,811

Int. Cl. C07d *39/00*

U.S. Cl. 260—240 G 8 Claims

New hydrazines, hydrazides and hydrazones of isoxazolo-pyridine carboxylic acids and esters having the general formulas



and salts thereof, are useful as central nervous system depressants and also increase the intracellular concentration of adenosine-3',5'-cyclic monophosphate.

3,825,536

BIS-CEPHALOSPORINS

Donald J. Perrella, Princeton Junction, and Joseph E. Dolfini, Princeton, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

No Drawing. Filed Sept. 22, 1972, Ser. No. 291,442

Int. Cl. C07d *99/24*

U.S. Cl. 260—243 C 11 Claims

Derivatives of difunctional compounds such as dicarboxylic acid, diisocyanates or diisothiocyanates wherein each functional group is reacted with 7-aminocephalosporanic acid or 7-aminodesacetoxycephalosporanic acid possess antibacterial activity.

3,825,537

1-THIAZOLIN - 2 - YL (OR THIAZIN - 2 - YL)-2-AMINOBENZIMIDAZOLES AND DERIVATIVES THEREOF

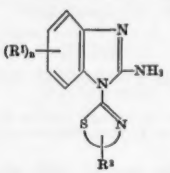
Rudiger D. Haugwitz, Highland Park, and Venkatachala Lakshmi Narayanan, Hightstown, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

No Drawing. Filed Feb. 28, 1972, Ser. No. 230,122

Int Cl. C07d *91/24, 93/06, 99/10*

U.S. Cl. 260—243 R 12 Claims

Thiazolinyl and thiazinyl derivatives of 2-aminobenzimidazoles are provided having the structure



wherein R^1, R^2 and *n* are defined hereinafter, and which are useful as antiinflammatory agents and disinfectants and as intermediates in the preparation of anthelmintic agents.

3,825,538

OXAZINES AND MONO(SECONDARY AMINOMETHYL)HYDROQUINONES AND PROCESS FOR THEIR PREPARATION

Delbert Daniel Reynolds and Bernard Calvin Cossar, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed May 15, 1970, Ser. No. 37,907

Int. Cl. C07d *87/14*

U.S. Cl. 260—244 R 6 Claims

A process, including the step of reacting a bis(alkoxymethyl)amine with a phenol, hydroquinone or other hydroxy substituted aromatic compound, for the preparation of benzoxazines is taught. A method is disclosed for the preparation of mono(secondary-aminomethyl)hydroquinone developing agents which includes the step of refluxing or heating benzoxazines in the presence of a strong acid. Hydroquinones are employed as photographic developing agents and/or photographic developing precursors.

3,825,539
4H[1]BENZOPYRANO[3,4-d]ISOXAZOLE DERIVATIVES

Jules Freedman, Thiensville, Wis., assignor to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Continuation-in-part of applications Ser. No. 670,772, Sept. 26, 1967, now Patent No. 3,553,228, and Ser. No. 67,603, Aug. 27, 1970, now Patent No. 3,692,796. This application Sept. 11, 1972, Ser. No. 288,117

Int. Cl. C07d *85/22*

U.S. Cl. 260—247.5 R **1 Claim**

The compounds are 4H[1]benzopyrano[3,4-d]isoxazole derivatives substituted in the 3-position which are useful as pharmaceutical agents, especially anti-inflammatory agents. They are also useful in preparing structurally related pharmaceutical compounds of known utility. In addition, they are useful as intermediates in the preparation of wood preservatives, mothproofing agents and pickling inhibitors.

3,825,540
3-(MORPHOLINOETHOXY)PYRIDAZINES

Henri Laborit, 78 Rue de la Convention, Paris 15, France

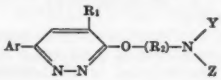
No Drawing. Filed Oct. 29, 1969, Ser. No. 872,363

Claims priority, application Great Britain, Nov. 1, 1968, 51,873/68

Int. Cl. C07d *87/40*

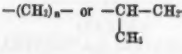
U.S. Cl. 260—247.5 R **2 Claims**

There is described new chemical compounds of the general formula:



where:

R_1 is a lower alkyl substituent particularly methyl;
R_2 is



n is 2, 3 or 4;

Ar is halogen or a lower alkoxy substituent particularly methoxy or a cycle particularly phenyl, naphthyl, thienyl; Y and Z represent lower alkyl group functions, these groups being able to be cyclized so as to form with the atom of nitrogen, a heterocyclic radical such as morpholinyl-, methylpiperazinyl, and non-toxic acid salts thereof, the said compounds having psychotropic activity in the fields of analgesia and anti-neurotic and anti-anxiety treatment of mammals including man.

3,825,541
(±)-9-(β-(3-α-AMINO - 2α - HYDROXY) CYCLOPENTYL) - 6-SUBSTITUTED-PURINES AND DERIVATIVES THEREOF

Robert Vince, St. Paul, Minn., assignor to The Regents of the University of Minnesota

Filed Jan. 26, 1972, Ser. No. 220,890

Int. Cl. C07d *57/38*

U.S. Cl. 260—253 **4 Claims**

A new class of chemical compounds, (±)-9-[β-(3α-amino-2α-hydroxy)cyclopentyl] - 6 - substituted - purines having the general formula:

wherein R is a substituent selected from the group consisting of hydroxyl, mercapto, methyl mercapto, halogen (chlorine, bromine, fluorine and iodine) and substituted amino:

wherein R′ and R″ may be the same or different substituents and are selected from the group consisting of hydrogen, methyl, ethyl, propyl and phenyl; X is an amino radical or amino acid; and acid salt derivatives of the same, such as acetic, hydrochloric, sulfuric, etc.; and the method of preparation thereof. The intermediate (±)-9-[β-(3α-amino - 2α - hydroxy)cyclopentyl] - 6 - dimethylaminopurine, or any of its corresponding 6-substituted derivatives, leads to the preparation of two diasterioisomers when condensed with the appropriately blocked L-amino acid. The separation of these diasterioisomers results in the isolation of antimicrobial and antitumor agents.

3,825,542
2-HETERO SUBSTITUTED 4(3H)-QUINAZOLINONES

Frederick C. Novello, Berwyn, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Oct. 12, 1972, Ser. No. 297,154

Int. Cl. C07d *51/42*

U.S. Cl. 260—256.5 R **8 Claims**

2-Hetero substituted 6-sulfamoyl-7-substituted-4(3H)-quinazolinone products are described. The products are prepared by conventional methods employing the appropriate anthranilamide and the hetero carboxylic acid halide. The products are xanthine oxidase inhibitors.

3,825,543
N-ACYLATED TETRAAZA-BICYCLO-NONANDIONES AND COMPOSITIONS FOR ACTIVATING OXYGEN

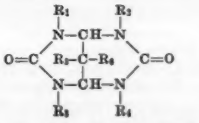
Dieter Kuhling, Monheim, and Helmut Bloching, Hilden, Germany, assignors to Henkel & Cie GmbH, Dusseldorf, Germany

No Drawing. Filed Mar. 15, 1972, Ser. No. 235,032

Int. Cl. C07d *51/46*

U.S. Cl. 260—256.4 F **15 Claims**

N-acylated 2,4,6,8 - tetraaza-bicyclo-(3,3,1)-nonan-3,7-diones of the formula



wherein at least two of R_1, R_2, R_3 and R_4 are acyls of organic carboxylic acids having 2 to 10 carbon atoms and the remainder of R_1, R_2, R_3 and R_4 are members selected from the group consisting of hydrogen and said acyl of organic carboxylic acids having 2 to 10 carbon atoms, and R_5 and R_6 are members selected from the group consisting of hydrogen and methyl, as well as the method of producing the same and compositions containing the same for activation of percompounds in aqueous solutions at temperatures below 70° C.

3,825,544
7 PIPERAZINOFLUORANS

Mutsuo Terayama and Kenji Yamamoto, Osaka, Japan, assignors to Yamamoto Kagaku Gosei Kabushiki Kaisha

No Drawing. Filed Dec. 15, 1971, Ser. No. 208,432

Claims priority, application Japan, Dec. 15, 1970, 45/112,052

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 PC **5 Claims**

An excellent pressure sensitive copying sheet is provided by applying as a color former certain encapsuled

fluoran compounds, i.e. fluoran compounds linking in the 7-position with at least one of the two nitrogen atoms in a piperazine ring and having a dialkylamino group in the 3-position to either a single sheet or to the upper leaf of a pressure sensitive paper. The color former is soluble in aromatic solvents and also has excellent light fastness.

3,825,545

ALKYLATION OF HETEROCYCLIC COMPOUNDS

Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

No Drawing. Filed Dec. 10, 1970, Ser. No. 97,034
Int. Cl. C07d 33/30
U.S. Cl. 260—283 R 11 Claims

It is disclosed that heterocyclic compounds can be alkylated with an alcohol or an amine as the alkylating agent in the presence of a Group VIII noble metal catalyst which is complexed with a biphyllic ligand. The alkyl heterocyclics are useful as solvents for terpenes or resins or as intermediates in the manufacture of dyes. The process offers an advantage in the alkylation of the heterocyclic nitrogen compounds since catalysts conventionally used for aromatic alkylation such as Friedel-Crafts catalysts, hydrofluoric acid or sulfuric acid are not entirely suitable since they are reactive with the nitrogen of the heterocyclic reactant. A typical reaction comprises the alkylation of quinoline with an alcohol or amine in the presence of a ruthenium-biphyllic ligand complex as the catalyst. Mild conditions can be employed for this alkylation, including temperatures from 30° to 300° C. and pressures from 1 to about 1000 atmospheres, sufficient to maintain a liquid phase under the alkylation conditions. Preferably the alkylation is performed at neutral to alkaline conditions.

3,825,546

SILICON AND GERMANIUM SUBSTITUTED AZASPIRANES

Leonard M. Rice, Columbia, Md., assignor to Geschickter Fund for Medical Research, Washington, D.C.

No Drawing. Filed Sept. 8, 1971, Ser. No. 178,816
Int. Cl. C07d 29/28
U.S. Cl. 260—293.66 15 Claims

Novel azaspiranes containing silicon or germanium in a ring, their acid addition and bis-quaternary salts as well as intermediate azaspirodiones. The azaspiranes are particularly useful for their ganglionic blocking activities.

3,825,547

N-ALKENYL AND N-ALKYNYL THIOAMIDES

Bernard Loev, Broomall, Pa., assignor to Smithkline Corporation, Philadelphia, Pa.

No Drawing. Filed May 22, 1972, Ser. No. 255,828
Int. Cl. C07d 31/50
U.S. Cl. 260—294.8 E 3 Claims

The compounds are N-alkenyl and N-alkynyl thioamides for example N-allyl and N-propargyl 2-(2-pyridyl) thioacetamide, which are inhibitors of gastric acid secretion.

3,825,548

BIS-p-DITHIINO(2,3-b:2',3'-e)PYRIDINE-2,3,7,8,10 PENTACARBONITRILE

Norman H. Kurihara, Walnut Creek, and Donald E. Bublitz, Concord, Calif., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Original application Jan. 7, 1971, Ser. No. 104,799, now Patent No. 3,761,475, dated Sept. 25, 1973. Divided and this application Feb. 20, 1973, Ser. No. 333,943
Int. Cl. C07d 31/50
U.S. Cl. 260—294.8 B 1 Claim

Novel polycyanodithiino aromatic N-heterocyclic compounds are prepared. These are useful as fungicides and bactericides.

3,825,549

CERTAIN DIHYDROPYRIDO[2,1-b][1,3]BENZODIAZEPINES AND BENZODIAZOCINES

Harry Louis Yale, New Brunswick, and Ramesh B. Petigara, Somerset, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

No Drawing. Continuation-in-part of abandoned application Ser. No. 299,986, Oct. 24, 1972. This application Mar. 8, 1973, Ser. No. 339,258
Int. Cl. C07d 31/50
U.S. Cl. 260—294.8 B 3 Claims

Compounds of the formula

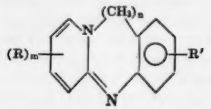


exhibit central nervous system stimulating properties and act as muscle relaxants.

3,825,550

MANUFACTURE OF N-ARYLTHIAZOLE-2-SULFENAMIDE

Marion J. Gattuso, Hoffman Estates, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Continuation-in-part of abandoned application Ser. No. 98,082, Dec. 14, 1970. This application Feb. 22, 1973, Ser. No. 334,539
Int. Cl. C07d 91/44
U.S. Cl. 260—302 S 8 Claims

N-arylthiazole-2-sulfenamides are prepared by reacting at a reflux temperature in a solvent a thiazolesulfenamide which is unsubstituted or alkyl-substituted in the amide moiety with an arylamine and continuously removing the ammonia or amine which is evolved during the reaction by utilizing a solid absorbent.

3,825,551

CERTAIN 3-HALO-1,2,4-THIADIAZOLES AND SYNTHESIS

Lawrence S. Wittenbrook and Richard J. Timmons, Marysville, Ohio, assignors to The O. M. Scott & Sons Company, Marysville, Ohio

No Drawing. Application Feb. 28, 1969, Ser. No. 803,411, now Patent No. 3,736,328, which is a continuation-in-part of abandoned application Ser. No. 578,991, Sept. 13, 1966. Divided and this application Apr. 6, 1972, Ser. No. 241,846
Int. Cl. C07d 91/60
U.S. Cl. 260—302 SD 7 Claims

Novel 3-(halogen)-5-(organothio)-, (sulfinyl)-, and (sulfonyl)-1,2,4-thiadiazoles and their production and use.

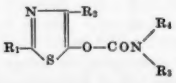
3,825,552

THIAZOLE CARBAMATE PESTICIDES

John H. Davies, Boughton, and Royston H. Davis, Rainham, England, assignors to Shell Oil Company, New York, N.Y.

No Drawing. Filed Jan. 31, 1972, Ser. No. 222,370
Claims priority, application Great Britain, Feb. 10, 1971, 4,374/71
Int. Cl. C07d 91/32
U.S. Cl. 260—302 R 3 Claims

Thiazole carbamate derivatives of the formula



where R_1 is alkyl, alkylthio, alkoxy, or aryl; R_2 is hydrogen, alkyl optionally substituted by alkylthio or alkylene-

dioxy, alkylthio optionally substituted by cyano, alkoxy, or aryl; and R_3 and R_4 are hydrogen or alkyl, are useful as pesticides, particularly as insecticides and acaricides.

3,825,553

CERTAIN 5-ARYLTHIAZOLIDINES

Julius Diamond, Lafayette Hill, and Norman J. Santora, Roslyn, Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

No Drawing. Original application May 5, 1970, Ser. No. 34,870. Divided and this application Mar. 10, 1972, Ser. No. 233,705

Int. Cl. C07d *91/16*

U.S. Cl. 260—306.7 **5 Claims**

Certain substituted α-halo and α-mercaptophenylacetic acids and substituted phenylacetic acids having in α-position a sulfur-containing group, a cyano group, or an amino group, their substantially non-toxic esters, salts, and acid amides as well as 5-phenyl substituted 2-imino-4-oxothiazolidines and 5 - phenyl substituted 2,4-dioxothiazolidines have a high anti-inflammatory, analgesic, and antipyretic activity, low toxicity, and/or a favorable therapeutic index with minor or no side-effects. Preferred compounds of this invention are α,m-dichloro-p-cyclohexylphenylacetic acids and its esters and salts.

3,825,554

METHOD FOR PREPARING CYCLIC NITRILE CARBONATES

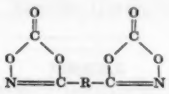
Emmett H. Burk, Jr., Glenwood, and Karl E. Fuger, Harvey, Ill., assignors to Atlantic Richfield Company, New York, N.Y.

No Drawing. Filed June 13, 1969, Ser. No. 833,195

Int. Cl. C07d *85/06*

U.S. Cl. 260—307 A **13 Claims**

A method for the preparation of cyclic nitrile carbonates having the formula:



wherein R is hydrocarbon of 4 to about 12, or to about 20, carbon atoms by the reaction of an hydroxamic acid with phosgene is disclosed. The method of this invention employs a dual solvent system comprising a combination of alkaline aqueous and organic solvents to provide high yields of a relatively pure product.

3,825,555

3-SUBSTITUTED 4-ALKANOYL OXAZASPIRO INSECT REPELLENTS

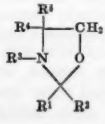
Thomas A. Lajiness, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

No Drawing. Original application Mar. 16, 1970, Ser. No. 20,097, now Patent No. 3,707,541. Divided and this application May 22, 1972, Ser. No. 255,893

Int. Cl. C07d *85/26*

U.S. Cl. 260—307 F **3 Claims**

A compound of the formula



wherein R^1 and R^2 taken together are alkylene having from four to six carbon atoms, R^3 is an alkanoyl, R^4 is an alkyl group having less than four carbon atoms, and R^5 is hydrogen or an alkyl group having less than four carbon atoms.

3,825,556

N¹-(SUBSTITUTED ETHYL)INDAZOLES

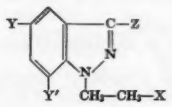
Pasquale P. Minieri, Woodside, N.Y., assignor to Tenneco Chemicals, Inc.

No Drawing. Continuation-in-part of applications Ser. No. 689,812, Dec. 12, 1967, now Patent No. 3,641,050, and Ser. No. 141,999, May 10, 1971, now Patent No. 3,741,979. This application Feb. 7, 1972, Ser. No. 224,294

Int. Cl. C07d *49/18*

U.S. Cl. 260—310 C **1 Claim**

Compounds that have the structural formula



wherein X represents halogen, —SCN, —OR, or —N=R'; Y and Y' each represents hydrogen, halogen, lower alkyl, nitro, amino acoylamino, aroylamino, (halobenzylidene) amino, or —N=R'; Z represents hydrogen, halogen, acoylamino, or —N=R'; R represents hydrogen, alkyl having 1 to 12 carbon atoms, haloalkyl having 1 to 4 carbon atoms, phenyl, or substituted phenyl wherein the substituent is halogen, hydroxyl, alkyl, or nitro; and R' represents an alkylene group having from 1 to 8 carbon atoms, can be used to control the growth of a variety of plant and animal pests. Illustrative of these compounds is N¹-(2-hydroxyethyl)-5-nitroindazole.

3,825,557

O-(1-SUBSTITUTED - 3-METHYL-4-CHLORO-PYRAZOLO)-THIONOPHOSPHORIC (PHOSPHONIC) ACID ESTERS

Helimut Hoffmann, Wuppertal-Elberfeld, and Wolfgang Behrenz and Ingeborg Hammann, Cologne, Germany, assignors to Bayer Aktiengesellschaft

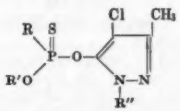
No Drawing. Filed June 23, 1972, Ser. No. 265,844

Claims priority, application Germany, July 2, 1971, P 21 32 938.4

Int. Cl. C07f *9/16, 9/40*

U.S. Cl. 260—310 R **7 Claims**

O-(1 - substituted - 3 - methyl - 4 - chloro-pyrazolo)-thionophosphoric (phosphonic) acid esters of the formula



(I)

in which

R is an alkyl or alkoxy radical of 1 to 6 carbon atoms,
R' is alkyl of 1 to 6 carbon atoms, and
R'' is alkyl or cyanoalkyl wherein the alkyl radical has 1 to 6 carbon atoms, or phenyl,

which possess insecticidal and acaricidal properties.

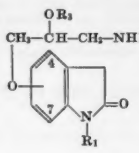
3,825,558

SUBSTITUTED AMINOPROPOXY-2-INDOLINONES

Fritz Seemann, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

No Drawing. Filed June 19, 1972, Ser. No. 263,768
Claims priority, application Switzerland, June 24, 1971, 9,247/71, 9,248/71, 9,251/71
Int. Cl. C07d 27/40
U.S. Cl. 260—325 19 Claims

The present invention concerns novel heterocyclic compounds of the formula:



wherein

R_1 is hydrogen or alkyl,

R_2 is a substituted or unsubstituted aromatic or aliphatic hydrocarbon and

R_3 is hydrogen or a carbonyl substituent and the side chain is in the 4 or 7 position of the oxindole nucleus.

The compounds possess pharmacological properties.

3,825,559

OPTICAL RESOLUTION OF DL-TRYPTOPHAN

Hideo Tazuke, Toshio Kitahara, and Hiroo Kageyama, Kanagawa-ken, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

No Drawing. Filed Sept. 10, 1971, Ser. No. 179,587
Claims priority, application Japan, Sept. 12, 1970, 45/80,177
Int. Cl. C07d 27/60
U.S. Cl. 260—326.14 T 1 Claim

DL-tryptophan hydrohalide is resolved into its optically active enantiomorphs by forming a free hydrogen halide containing saturated or supersaturated solution of said DL-tryptophan hydrohalide, and contacting said solution with crystals of one of said enantiomorphs.

3,825,560

N-MONOACYL DERIVATIVES OF ARGININE

Tadaomi Saito, 890 Fukaya-cho, Totsuka-ku, Yokohama-shi; Masahiro Takehara, 1060 Ogura, Kawasaki-shi; Kazuhiko Yamada, 22–22, 3-chome, Fujigaoka, Fujisawa-shi; and Ryonosuke Yoshida, 1265–11 Kajiwara, Kamakura-shi, all of Kanagawa-ken, Japan; and Yukiko Sasaki, 28–6, 3-chome, Minami-cho, Kokubunji-shi, Tokyo, Japan

Continuation-in-part of abandoned application Ser. No. 99,768, Dec. 21, 1970. This application June 28, 1971, Ser. No. 157,584
Claims priority, application Japan, Dec. 30, 1969, 45/1,750
Int. Cl. C07d 27/08
U.S. Cl. 260—326.45 6 Claims

The lower alkyl or benzyl esters and amides of the N-monoacyl derivatives of the basic amino acids (α,γ-diaminobutyric acid, orthinine, citrulline, lysine, arginine, and histidine)and their N-methyl and N-benzyl derivatives in which acyl is the acyl radicalof an aliphatic monocarboxylic acid having 6 to 20 carbon atoms have bacteriostatic effects of the order of magnitude of that of hexachlorophene. They may be used as antibial agents in the form of their water soluble salts with hydrochloric acid, pyrrolidone carboxylic acid, and other inorganic and organic acids.

3,825,561

FLUORAN COMPOUNDS

Takashi Akamatsu, Ashiya, Koichi Koga, Toyonaka, Mitsuru Kondo, Kawanishi, Makoto Miyake, Nishinomiya, and Hiroshi Iwasaki, Takatsuki, Japan, assignors to Sumitomo Chemical Company, Higashi-ku, Osaka, and Paper Manufacturing Co., Ltd., Chuo-ku, Tokyo, Japan

No Drawing. Filed Oct. 8, 1971, Ser. No. 187,919
Claims priority, application Japan, Oct. 12, 1970, 45/90,181; Nov. 11, 1970, 45/99,663; Dec. 25, 1970, 45/129,020; Dec. 26, 1970, 45/130,393; Dec. 29, 1970, 46/124,393; Apr. 15, 1971, 46/24371
Int. Cl. C07d 7/42
U.S. Cl. 260—335 7 Clams

Novel fluoran derivatives such as, for example, 2-diallylamino - 6 - diethylaminofluoran, 2,2′-iminobis(6-diethylaminofluoran), 2-[bis(p - chlorobenzyl)amino]-6-dimethylaminofluoran, 2-(o-chlorobenzylamino) - 6 - diethylaminofluoran, and 2-(N - phenyl-N-allylamino-6-dimethylaminofluoran. These fluoran derivatives are useful as a coloring material for record material systems, such as pressure-sensitive copying paper or heat-sensitive copying paper, wherein colored images formed by an electron-donor-acceptor color-forming reaction between coloring material and acidic material.

3,825,562

PROCESS FOR RECOVERING 2,2,4-TRIMETHYL-4-(4-HYDROXYPHENYL) CHROMAN

Donald B. G. Jaquiss, New Harmony, Ind., assignor to General Electric Company

No Drawing. Filed July 18, 1972, Ser. No. 272,799
Int. Cl. C07d 7/32
U.S. Cl. 260—345.2 4 Claims

A process for recovering pure 2,2,4-trimethyl-4-(4-hydroxyphenyl) chroman from the by-products of reaction of acetone and phenol to prepare 2,2-bis(4-hydroxyphenyl) propane which process consists of treating the by-product stream with an aqueous caustic solution of at least 2N to dissolve the byproducts and then adjusting the pH to at least 10.0 in order to precipitate 2,2,4-trimethyl-4-(4-hydroxyphenyl) chroman.

3,825,563

PRODUCTION OF STABLE, NONHYDROUS, HOMOGENEOUS, IN NATURAL AND MINERAL OILS SOLUBLE VITAMIN-E-ACTIVE CREAM-BASE-CO-ESTERS OF THE MINERAL-OIL-INSOLUBLE d-ALPHA-TOCOPHERYL-ACID-SUCCINATE WITH ANHYDROUS OILS

Gerhard W. Ahrens, 1781 E. 15th St., Brooklyn, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 862,927, Oct. 1, 1969. This application Apr. 13, 1971, Ser. No. 133,757
Int. Cl. C07d 7/22
U.S. Cl. 260—345.5 4 Claims

The invention concerns a method for preparing stable, nonhydrous homogeneous, in natural and mineral oils soluble Vitamin-E-active cream-base-co-esters of the mineral-oil-insoluble d-alpha-tocopheryl-acid-succinate with anyhdrous oils by the direct esterification reaction between the said d-alpha-tocopheryl-acid-succinate and the anhydrous oils or, in a modification thereof, by the said direct esterification reaction between the d-alpha-tocopheryl-acid-succinate, magnesium stearate as a partial substituent for the expensive d-alpha-tocopheryl-acid-succinate and the anhydrous oils, carried to completion by the application of gradually increasing reaction temperatures to the reaction mixture consisting of the said d-alpha-tocopheryl-acid-succinate, with or without its partial substituent magnesium stearate, and the anhydrous oils lacking both in practical water absorption capacities and therefore facilitating water formed in the reaction to

vaporize as the esterification reaction goes to completion forming thereby the stable, nonhydrous, homogeneous and in natural and mineral oils soluble Vitamin-E-active cream-base-co-esters of d-alpha-tocopheryl-acid-succinate with anhydrous oils as are excellently suited for versatile additions of Vitamin-E-active potencies to a wide variety of topical natural as well as mineral oil base preparations for the ready introduction therein of a wide range of Vitamin E potencies from as low as 25 I.U. to as much as about 726 I.U. Vitamin E, without requiring the use of emulsifying agents, or which may be used as is in their creamy cream-base-co-ester form, per se.

3,825,564
ANTHRAQUINONE SULFONIC ACIDS
Wolfgang Schoenauer, Riehen, Switzerland, and Roland Wald, Pfetterhouse, France, assignors to Sandoz Ltd., Basel, Switzerland
No Drawing. Filed Aug. 3, 1971, Ser. No. 175,784
Claims priority, application Switzerland, Aug. 12, 1970, 12,093/70; Nov. 13, 1970, 16,797/70
Int. Cl. C09b *1/30, 1/34*
U.S. Cl. 260—372 **19 Claims**

Anthraquinones bearing in the 1 and 4 positions secondary amino groups and in the 6 position an aminocarbonyl group and containing at least one SO_3H group give brilliant dyeings and prints of green to blue shades and of good fastness.

3,825,565
3α-HYDROXY-Δ⁴-STEROIDS OF THE PREGNANE SERIES AND ESTERS THEREOF
Gordon Ian Gregory, Buckinghamshire, and Niall Galbraith Weir, London, England, assignors to Glaxo Laboratories Limited, Middlesex, England
No Drawing. Filed Nov. 2, 1971, Ser. No. 194,918
Int. Cl. C07c *169/32*
U.S. Cl. 260—397.4 **10 Claims**

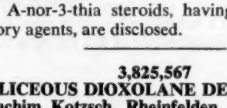
3α - Hydroxy-Δ⁴-steroids and 3α-esters thereof having an acetyl group in the β-configuration and a hydrogen atom in the α-configuration at the 17-position and either two hydrogen atoms or a keto group at the 11-position. The disclosed compounds with carriers or excipients to provide compositions having marked anaesthetic properties.

3,825,566
A-NOR-3-THIA CORTICOIDS
Christopher M. Cimarusti, Hamilton, Frederick F. Giarrusso, Belle Mead, and Seymour D. Levine, North Brunswick, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.
No Drawing. Filed Feb. 15, 1973, Ser. No. 332,984
Int. Cl. A61k *27/00;* **C07d** *63/04*
U.S. Cl. 260—332.3 P **18 Claims**

Novel A-nor-3-thia steroids, having utility as anti-inflammatory agents, are disclosed.

3,825,567
SILICEOUS DIOXOLANE DERIVATIVES
Hans-Joachim Kotzsch, Rheinfelden, and Hans-Joachim Vahlensieck, Wehr, Baden, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany
No Drawing. Filed Nov. 29, 1972, Ser. No. 310,495
Claims priority, application Germany, Dec. 3, 1971, P 21 59 991.7
Int. Cl. C07d *13/04*
U.S. Cl. 260—340.2 **3 Claims**

Glycidyloxypropylalkoxysilanes are produced by thermal treatment of novel siliceous dioxolane derivatives of the formula:



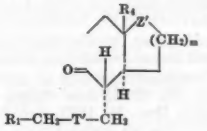
wherein *a* is 0 or 1 and R represents an oxygen radical or two hydrogen atoms and R′ and R″ each represents an alkyl radical, wherein the R‴s can be the same or different. The glycidyl products are useful as adhesives.

3,825,568
PRODUCTION OF ANHYDROUS 1,4-DIOXANE
Hans-Georg Schecker, 28 Berner Weg; Waldemar Koehler, 7 An der Froschlache; and Bruno Sander, 10 Moerikestrasse, all of 6700 Ludwigshafen, Germany
No Drawing. Filed June 27, 1972, Ser. No. 266,607
Int. Cl. C07d *15/00*
U.S. Cl. 260—340.6 **6 Claims**

A process for the production of the valuable solvent 1,4-dioxane by dimerization of ethylene oxide in the presence of SiF_4 or BF_3 or of the addition compound formed from BF_3 and 1,4-dioxane as a catalyst, wherein the catalyst is mixed with ethylene oxide present in the liquid phase at a temperature of from −50° C. to 0° C. and the mixture is then kept for another one hour to ten hours at a temperature of from −25° to +10° C. To complete the reaction, the reaction mixture may then be kept for up to three hours at a temperature of from +10° to +40° C. In this process pure 1,4-dioxane is obtained in a high space-time yield and in yields of more than 80% of theory.

3,825,569
SYNTHESIS OF TRICYCLIC CARBOCYCLIC COMPOUNDS AND INTERMEDIATES THEREFOR
Zoltan George Hajos, Upper Montclair, and Eugene Paul Oliveto, Glen Ridge, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.
No Drawing. Application Dec. 23, 1968, Ser. No. 786,445, now Patent No. 3,644,429, which is a continuation-in-part of application Ser. No. 687,463, Dec. 4, 1967, which is a continuation-in-part of application Ser. No. 544,677, May 25, 1966, which in turn is a continuation-in-part of application Ser. No. 495,672, Oct. 13, 1965, the latter three all now abandoned. Divided and this application Sept. 13, 1971, Ser. No. 180,115
Int. Cl. C07d *13/04*
U.S. Cl. 260—340.9 **18 Claims**

Methods for the preparation of 2,3,3a,4,5,7,8,9,9aβ,9bα-decahydro - 3aβ-primary lower alkyl-7-oxo-1H-benz[e] indenes and 4,4aβ,4bα,5,6,7,8,8a,9,10-decahydro-8aβ-primary lower alkyl - 3H-phenanthren-2-ones by cyclizing compounds of the formula



wherein R_1 is hydrogen or lower alkyl; Z′ is carbonyl or $CH(OR_2')$; R_2' is hydrogen, lower alkyl, lower alkanoyl, benzoyl, nitrobenzoyl, carboxy-lower alkanoyl, carboxybenzoyl, trifluoroacetyl or camphorsulfonyl; T′ is —C(X′)=CH—, —C(OR₃)=CH— or —Q′—CH_2—; R_3 is lower alkyl; X′ is bromine, chlorine or iodine; Q′ is carbonyl, lower alkylene dioxy-methylene, di-(lower alkoxy)-methylene or hydroxy-methylene, R_4 is lower primary alkyl and *m* is an integer having a value of 1 or 2.

The compounds of this series are useful as intermediates in the synthesis of known steroids which are pharmacologically active as fertility control agents.

3,825,570
PROCESS FOR THE PREPARATION OF ε-CAPROLACTONE

Yutaka Fujita, Tatsuyuki Naruchi, Yuitsu Honda, Kenji Ishimaru, and Eishin Yoshisato, Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

No Drawing. Filed Nov. 2, 1971, Ser. No. 195,032
Int. Cl. C07d 9/00
U.S. Cl. 260—343 **15 Claims**

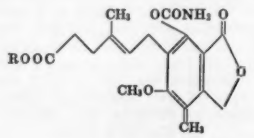
A process for the preparation of ε-caprolactone which comprises heating at least one amide selected from the group consisting of ε-hydroxycaproamide and amides of low polymerization products of ε-hydroxycaproic acid, in the presence of an alcoholic compound containing at least one free alcoholic hydroxyl group in its molecule, in an amount such that, when one ε-hydroxycaproic acid unit of the formula $\text{HO}-(\text{CH}_2)_5\text{CO}$ contained in the amide is calculated as one molecule of ε-hydroxycaproic acid, the total number of free alcoholic hydroxyl groups present in the reaction system exceeds the total number of carboxyl groups present in the reaction system, under such temperature and pressure conditions to allow distillation of ε-caprolactone.

3,825,571
MYCOPHENOLIC ACID DERIVATIVES

Takasi Mori, Tokyo, Sakae Takaku, Ageo, Seikichi Suzuki, Tokyo, and Minoru Tsuda, Shiki, Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed July 28, 1972, Ser. No. 275,901
Claims priority, application Japan, July 31, 1971, 46/57,141, 46/57,142
Int. Cl. C07d 5/34
U.S. Cl. 260—343.3 **6 Claims**

Mycophenolic acid derivatives represented by the formula



wherein R is lower alkyl or lower alkenyl, which are useful as an anti-cancer or anti-tumor agent and a process for the production thereof are disclosed.

3,825,572
EPIMERIC MIXTURES OF THE LACTONE 3,6-DIHYDRO-4,5-DIMETHYL-5-PHENYL-α-PYRONE

John J. van Venrooy, Media, Pa., assignor to Sun Research and Development Co., Philadelphia, Pa.

No Drawing. Continuation-in-part of application Ser. No. 258,282, May 31, 1972, now Patent No. 3,761,530. This application Dec. 26, 1972, Ser. No. 318,359
Int. Cl. C07d 7/16
U.S. Cl. 260—343.5 **8 Claims**

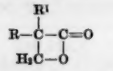
Epimeric mixtures of the novel lactone 3,6-dihydro-4,5-dimethyl-5-phenyl-α-pyrone may be prepared by reacting hydratropaldehyde with acetaldehyde or crotonaldehyde. These compounds are useful in V.I. stabilizers in lube oils, and as monomers in the preparation of polyesters. Under certain conditions a by-product comprising a novel linear condensation product, identified as an unsaturated aromatic aldehyde, is also formed. The relative proportions of the novel lactone and unsaturated aromatic aldehydes that are formed may be controlled by varying the ratio of hydratropaldehyde to acetaldehyde. The use of crotonaldehyde instead of acetaldehyde results in the formation of the novel lactone alone.

3,825,573
PURIFICATION OF α,α-DISUBSTITUTED-β-PROPIOLACTONES

William A. Ames, Longview, and James J. Ward, Henderson, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Dec. 16, 1971, Ser. No. 208,906
Int. Cl. C07d 3/00
U.S. Cl. 260—343.9 **10 Claims**

Polymerization grade α,α-disubstituted-β-propiolactone monomer having the general formula



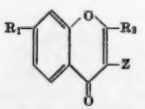
wherein R and R^1 are selected from the group consisting of straight- or branched-chain alkyl groups of from 1 to 10 carbon atoms, substituted of unsubstituted cyclic hydrocarbon groups of from 6 to 10 carbon atoms, or wherein R and R^1 join to form a ring of from 6 to 10 carbon atoms, is effectively obtained from impure monomer containing residual manufacturing impurities by treating the impure lactone monomer with an aluminum alkyl of the formula AlR^3_3 wherein R^3 is a lower alkyl group of from 1 to 8 carbon atoms, and subsequently distilling the purified monomer from the resultant solution at reduced pressure. The procedure yields a very pure polymerization grade α,α-disubstituted-β-propiolactone monomer which has a low polymerization index and from which a polymer having a high inherent viscosity can be formed.

3,825,574
PROCESS FOR PREPARING SUBSTITUTED CHROMONE-3-CARBONITRILES, CARBOXAMIDES AND CARBOXYLIC ACIDS

Richard E. Brown, Hanover, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

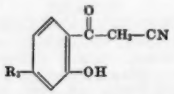
No Drawing. Filed Dec. 4, 1972, Ser. No. 311,586
Int. Cl. C07d 7/34
U.S. Cl. 260—345.2 **6 Claims**

This invention relates to a novel process for preparing chromones of the formula I:



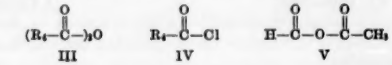
I

wherein R_1 represents hydroxy, lower alkoxy, or acyloxy; R_2 represents hydrogen, lower alkyl, fluorinated lower alkyl, alkoxycarbonyl, carboxy, or lower alkyl carboxylic acid; Z represents cyano, carbamoyl, or carboxy; and R_2 and Z together form a substituted pyrrole ring, by treating a substituted benzoylacetonitrile of the formula II:



II

wherein R_3 represents hydroxy or lower alkoxy, with an acid derivative having the formula III, IV, or V:



III IV V

wherein R_4 represents lower alkyl, fluorinated lower alkyl, alkoxycarbonyl or, together with the

of formula III, forms an up to 5 carbon atom cyclic anhydride, in the presence of a base, to effect acylation and ring closure, and obtain a substituted 3-cyanochromone derivative which may be hydrolyzed with a mineral acid to provide the corresponding substituted chromone-3-carboxamide or the corresponding substituted chromone-3-carboxylic acid. The compounds prepared by the process of this invention are useful as anti-allergic agents.

3,825,575

PERFLUOROALKYLALKYLMONOCARBOXYLIC ACID ESTERS

Horst Jaeger, Bettingen, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Filed Feb. 3, 1971, Ser. No. 112,445
Claims priority, application Switzerland, Feb. 9, 1970, 1,825/70
Int. Cl. C07c *69/62*; D06m *13/20*
U.S. Cl. 260—408 11 Claims

Perfluoroalkylalkylmonocarboxylic acid esters are provided which are derived from acyclic aliphatic epoxides. These esters contain at least one perfluoroalkyl radical with 4 to 14 carbon atoms which is bonded over an alkylene group with 1 to 10 carbon atoms to a carboxyl group, which in turn is bonded in a ester-like manner to an acyclic radical. This radical contains in the 2-position to the ester bridge an optionally etherified or esterified hydroxyl group; said radical is bonded via an ester, ether or carbamate bridge to an alkenyl group with 2 to 3 carbon atoms which is optionally linked via a second ester, ether or carbamate bridge to an acyclic radical which in turn may be bonded via an ester bridge and an alkylene group to a perfluoroalkyl radical.

The perfluoroalkylalkylmonocarboxylic acid esters and also their homopolymers or their copolymers with other polymerisable products are used to achieve oleophobic furnishes on porous or non-porous substrates, especially on fibrous materials, such as textiles and papers.

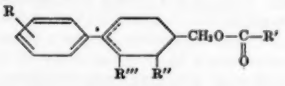
3,825,576

ALKYL ESTERS OF 2-(LOWER ALKYL)-3-(LOWER ALKYL) - 4 - ARYL-3- OR 4 - CYCLOHEXENE-CARBINOLS

George Karmas, Bound Brook, N.J., assignor to Ortho Pharmaceutical Corporation

No Drawing. Original application May 14, 1968, Ser. No. 728,900, now Patent No. 3,557,129. Divided and this application Sept. 14, 1970, Ser. No. 72,220
Int. Cl. A61k *27/00*; C07c *69/74, 69/76*
U.S. Cl. 260—410.5 14 Claims

Compounds of the general formula



are disclosed wherein —R is selected from the group consisting of hydrogen, hydroxy, lower alkoxy of up to 8 carbon atoms, lower alkyl of up to 8 carbon atoms, and lower alkyl anilino of up to 4 carbon atoms; —R′ is selected from the group consisting of alkyl and alkenyl of up to 20 carbon atoms, cycloalkyl lower alkyl of up to 3 carbon atoms in the alkyl portion, adamantyl, pyridyl, furyl, lower alkyl carboxylic acids and their alkali metal salts, esters and carbamates; and R″ and R‴ are selected from the group consisting of lower alkyl of up to 3 carbon atoms. These compounds exhibit estrogenic properties and when given in a single subcutaneous dose have long acting effects in the suppression of animal reproduction.

3,825,577

METHOD OF PREPARING POLYFLUORINATED SULPHONIC ACID AND DERIVATIVES

Jean-Pierre Lalu, La Mulatiere, and Louis Foulletier, Oullins, France, assignors to Produits Chemiques Ugine Kuhlmann, Paris, France

No Drawing. Original application Aug. 18, 1969, Ser. No. 851,081. Divided and this application May 14, 1971, Ser. No. 143,589
Claims priority, application France, Aug. 21, 1968, 163,587
Int. Cl. C07f *7/24*
U.S. Cl. 260—435 R 5 Claims

New products and compositions of matter complying with the general formula:

$$[C_nF_{2n+1}(CH_2)_bSO_2—Z]_dM$$

wherein: C_nF_{2n+1} represents a straight or ramified branched perfluorinated chain: n represents a whole number between 1 and 20, b is a whole number between 2 and 20, preferably equal to 2 or 4, Z represents a chlorine, bromine or an oxygen atom (when Z is a chlorine or a bromine atom, M is nothing and d is equal to 1), when Z is an oxygen atom: M is a hydrogen atom in which case, d is equal to 1, M is a metal of the Groups I_A, II_A, I_B, II_B, VIII of the periodic table, the ammonium radical, the aluminum or the lead radical, and in which case d represents the valence of this metal and methods for preparing new products as illustrated by the following representative reactions.

3,825,578

WATER REPELLENT COMPOSITION OF ORGANOSILICON COMPLEX

Otto J. Maltenieks, Marietta, Ga., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

No Drawing. Filed July 27, 1973, Ser. No. 383,058
Int. Cl. C07d *7/18*
U.S. Cl. 260—448.8 R 3 Claims

A water repellent composition of methyloctadecyldichlorosilane partially hydrolized with isopropanol is disclosed which is useful as a water repellent coating material for both transparent and non-transparent surfaces but has special utility when employed on non-optical surfaces. The useful lifetime of a water repellent coating made with this composition permits its use as a semi-permanent coating for such surfaces.

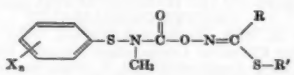
3,825,579

N-PHENYLTHIOCARBAMOYLTHIO-HYDROXIMATE PESTICIDES

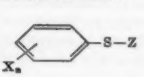
Keimei Fujimoto, Kobe, Masachika Hirano, Mino, and Hisami Takeda and Shigehiro Ooba, Takarazuka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

No Drawing. Filed Sept. 21, 1971, Ser. No. 182,537
Claims priority, application Japan, Sept. 24, 1970, 45/84,376
Int. Cl. C07c *119/00*
U.S. Cl. 260—453 R 7 Claims

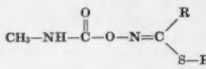
A carbamate compound of the formula:



wherein X is hydrogen, lower alkyl, lower alkoxy, nitro or halogen, R and R′ are each lower alkyl and n is an integer of 1 to 5, which is useful as an insecticide, a nematocide and an acaricide with less toxicity to warm-blooded animals and can be prepared by reacting a benzenesulfenyl halide of the formula:



wherein X and *n* are each as defined above and Z is halogen with an N-methylcarbamic ester of the formula:



wherein R and R′ are each as defined above in an inert solvent in the presence of a base at a temperature of −10 to 50° C.

3,825,580

HEAT-RESISTANT ADHESIVE COMPOSITIONS CONTAINING RADICAL POLYMERIZABLE ALPHA-CYANOACRYLATES

Hiroyuki Kato, Isao Tsuzi, Kishiro Azuma, and Hidemaro Tatemichi, Nagoya, Japan, assignors to Toagosei Chemical Industry Co., Ltd., Tokyo, Japan

No Drawing. Original application Aug. 16, 1971, Ser. No. 172,282, now abandoned. Divided and this application Dec. 13, 1972, Ser. No. 314,507

Claims priority, application Japan, Aug. 18, 1970, 45/71,737

Int. Cl. C07c *121/18*

U.S. Cl. 260—465.4 **1 Claim**

A heat-resistant adhesive composition comprising a radical polymerizable α-cyanoacrylate represented by the formula,

$$CH_2=C(CN)COOR$$

wherein R is an alkenyl, alkinyl, alkenyloxyalkyl or cycloalkenyl group, and at least 0.1% by weight based on the weight of the composition of a radical initiator. The said adhesive composition is not only instantaneously adhesive at room temperature but also has a sufficiently practical bonding strength even at such a high temperature as 150° C. or above.

3,825,581

PRODUCTION OF MONOCHLOROACETONITRILE

Walter A. Gay and David F. Gavin, Cheshire, Conn., assignors to Olin Corporation

No Drawing. Filed Feb. 12, 1973, Ser. No. 332,045

Int. Cl. C07c *121/02*

U.S. Cl. 260—465.7 **9 Claims**

A process is provided for producing monochloroacetonitrile by liquid phase chlorination of acetonitrile. Acetonitrile is chlorinated at a temperature in the range of 30–50° C. in a reaction mixture containing at least 18% by weight trichloroacetonitrile, the latter being formed in situ or added as an ingredient in a starting reaction mixture. Following chlorination, the reaction mixture is neutralized at a temperature of not more than 70° C. Monochloroacetonitrile is then separated from the reaction mixture by distillation or other suitable means.

3,825,582

SIDE CHAIN HALOGENATED ALKYL PHENYL CARBAMATES

Edward D. Weil, Hastings-on-Hudson, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Application Nov. 7, 1968, Ser. No. 816,426, now Patent No. 3,651,129, which is a division of application Ser. No. 305,509, Aug. 29, 1963, now Patent No. 3,420,868. Divided and this application June 14, 1971, Ser. No. 153,050

Int. Cl. C07c *125/06*

U.S. Cl. 260—471 C **7 Claims**

Alkyl phenyl carbamates containing a halogenated side chain are useful as pesticides. Such products, for example, α,α′-dichloro-3,5-xylenyl N-methyl carbamate are prepared by reacting the corresponding haloformates with an alkylamine.

3,825,583

ESTER OF 3-HYDROXY-α-[(METHYLAMINO) METHYL]BENZYL ALCOHOL

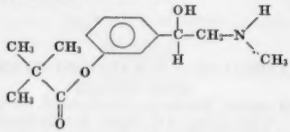
Anwar A. Hussain and James E. Truelove, Lawrence, Kans., assignors to Interx Corporation, Lawrence, Kans.

No Drawing. Filed Apr. 26, 1973, Ser. No. 354,540

Int. Cl. C07c *69/24*

U.S. Cl. 260—479 R **2 Claims**

A novel ester of the formula:



and the non-toxic pharmaceutically acceptable acid addition salts thereof. The compound evidences increased stability and lipoidal solubility and is extremely valuable in the treatment of conditions responsive to sympathomimetic agents and especially in the management of asthma, nasal congestion, and, as a decongestant, vasoconstrictor, mydriatic agent and anti-glaucomatous agent in the practice of ophthalmology.

3,825,584

4-HEXENOIC COMPOUNDS

Hiroshi Morimoto, Nishinomiya, Masazumi Watanabe, Takatsuki, and Isuke Imada, Ibaraki, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

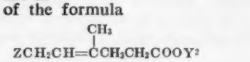
No Drawing. Original application Feb. 8, 1971, Ser. No. 113,773, now Patent No. 3,728,362, dated Apr. 17, 1973. Divided and this application Oct. 5, 1972, Ser. No. 295,098

Claims priority, application Japan, Feb. 7, 1970, 45/10,846; Feb. 11, 1970, 45/11,616

Int. Cl. C07c *69/66*

U.S. Cl. 260—484 R **3 Claims**

Compounds of the formula



wherein Z is hydroxy, acetoxy or halogen and Y^2 is hydrogen or a lower alkyl group, which are useful in preparing quinones having strong anti-inflammatory activity.

3,825,585

N-CYCLOALKYL HYDROXAMIC ACIDS

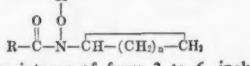
Cecil C. Chappelow, Jr., and James F. Engel, Kansas City, Mo., assignors to Kerr-McGee Corporation, Oklahoma City, Okla.

No Drawing. Filed June 3, 1971, Ser. No. 149,750

Int. Cl. C07c *103/30;* **C07f** *9/00*

U.S. Cl. 260—500.5 H **7 Claims**

A new class of compounds useful, for example, as metal extractants, is provided. The compounds are hydroxamic acids, with N-cycloalkyl groups and represented by the general formula:



wherein *n* is an integer of from 3 to 6, inclusive, and R is a hydrocarbon radical containing from 1 to 20 carbon atoms.

3,825,586

PROCESS FOR ENRICHING TRANS-TRANS SALTS OF BIS(4-AMINOCYCLOHEXYL)METHANE AND 1,12-DODECANEDIOIC ACID

Klaus Friedrich Traumann, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Nov. 21, 1969, Ser. No. 878,930

Int. Cl. C07c *87/14*

U.S. Cl. 260—501.2 **3 Claims**

A salt of bis(4 - aminocyclohexyl)methane and 1,12-dodecanedioic acid can be enriched in trans-trans isomer

content by preparing the salt in and precipitating from methanol.

3,825,587
SUBSTITUTED PHENYLACETIC ACID COMPOUNDS

Julius Diamond, Lafayette Hill, and Norman J. Santora, Roslyn, Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

No Drawing. Original application May 5, 1970, Ser. No. 34,870. Divided and this application Mar. 10, 1972, Ser. No. 233,704

Int. Cl. C07c *63/00*

U.S. Cl. 260—501.16 **2 Claims**

Alpha,alpha - di - (m-chloro - p - cyclohexylphenyl)-alpha,alpha'-dithiodiacetic acid and its diethylammonium salt are disclosed and have a high anti-inflammatory, analgesic, and antipyretic activity, low toxicity, and/or a favorable therapeutic index with minor or no side-effects.

3,825,588
UNSATURATED ZWITTERIONIC SURFACE ACTIVE COMPOUNDS

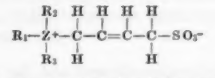
Melvin A. Barbera, Mount Healthy, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Original application Mar. 31, 1970, Ser. No. 24,330, now Patent No. 3,668,240. Divided and this application Apr. 28, 1972, Ser. No. 248,765

Int. Cl. C07c *143/16*

U.S. Cl. 260—513 R **2 Claims**

Zwitterionic surface active compounds are provided having the following formula:



wherein R_1 represents an unsaturated or saturated aliphatic group having 6 to 24 carbon atoms, R_2 and R_3 each represent an alkyl group having 1 to 6 carbon atoms, and Z represents nitrogen or phosphorus.

These compounds have valuable surface active properties that make them especially useful as detergent compounds.

3,825,589
PRODUCTION OF 2-BUTYL-N,N'-DIPHENYL-MALONOMONOHYDRAZIDE

Kurt Klemm, Allensbach, and Erhard Langenscheid, Constance, Germany, assignors to BYK-Gulden Lomberg Chemische Fabrik GmbH, Constance, Germany

No Drawing. Filed Nov. 1, 1971, Ser. No. 194,536

Int. Cl. C07c *103/34*

U.S. Cl. 260—518 R **19 Claims**

Phenylbutazone is hydrolyzed in admixture with 1 to 10 equivalents of a water-soluble alkali metal salt and 10 to 100 moles of water per mole of phenylbutazone. Resulting 2 - butyl-N,N'-diphenylmalonomonohydrazide is then separated from the hydrolysis product.

3,825,590
HYDROXY-HYDROXYMETHYL-SUBSTITUTED PHENYLALANINE DERIVATIVES

John T. Suh, Mequon, and Richard A. Schnettler, Brown Deer, Wis., assignors to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Filed Feb. 25, 1972, Ser. No. 229,558

Int. Cl. C07c *101/72*

U.S. Cl. 260—519 **3 Claims**

The compounds are hydroxy-hydroxymethyl-substituted phenylalanines which are useful as antihypertensive agents and chelating agents for heavy metal ions. A species disclosed is 3-hydroxymethyl tyrosine.

3,825,591
ORALLY APPLICABLE CONTRAST AGENTS FOR CHOLECYSTOGRAPHY

Ernst Felder and Davide Pitre, Milan, Italy, assignors to Bracco Industria Chimica Societe per Azioni, Milan, Italy

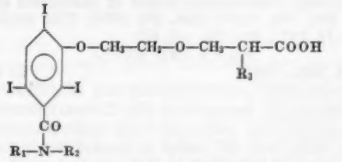
No Drawing. Filed June 1, 1972, Ser. No. 258,777

Claims priority, application Switzerland, June 23, 1971, 9,147/71

Int. Cl. C07c *101/72*

U.S. Cl. 260—519 **4 Claims**

Compounds of the formula



wherein R_1 is methyl or ethyl when R_2 is hydrogen, or R_1 and R_2 jointly are ethyleneoxyethylene, and R_3 is methyl or ethyl, and their physiologically tolerated alkali metal, alkaline earth metal, and alkanolamine salts produce superior X-ray images of the gall bladder and of the bile ducts after oral ingestion and are well tolerated and quickly eliminated in effective doses.

3,825,592
PHENOLIC AMINOPOLYCARBOXYLIC CHELANTS

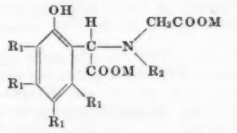
Avis L. McCrary and David A. Wilson, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Sept. 22, 1971, Ser. No. 182,894

Int. Cl. C07c *101/72*

U.S. Cl. 260—519 **3 Claims**

New phenolic aminopolycarboxylic chelants of the formula



wherein M represents hydrogen or alkali metal ion, R_1 represents hydrogen, alkyl, $SO_3(M)$, or halogen, and R_2 represents hydrogen or $(-CH_2-COO(M))$, have been prepared which are useful in the correction of iron deficiencies in plants and in removal of iron scale.

3,825,593
CARBOXYLATION OF PHENOLS

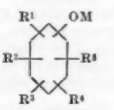
William H. Meek, Northfield, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

No Drawing. Continuation-in-part of application Ser. No. 712,933, Mar. 14, 1968, which is a continuation-in-part of application Ser. No. 629,094, Apr. 7, 1967, both now abandoned. This application Aug. 29, 1969, Ser. No. 854,269

Int. Cl. C07c *65/04*

U.S. Cl. 260—521 C **5 Claims**

Substituted aromatic phenates of the formula:



wherein the groups represented by R's are selected from hydrogen, halogen, alkyl, alkylthio, alkoxy, dialkylamino, benzyl and alpha-methylbenzyl and wherein two of said R's can be taken together to form a naphthyl or quinoline ring, providing that not more than four R's are hydrogen; and M is a metal, preferably an alkali metal, are carbox-

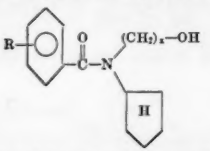
ylated by reaction with carbon dioxide in good yield in the presence of an aliphatic N,N-dimethylamide having from 3 to 10 carbon atoms and preferably in the presence of an excess of metal alkoxide based on the carbon dioxide. Preferably amides are dimethylformamide and dimethylacetamide.

3,825,594
BIS(TRIFLUOROMETHYL)BENZAMIDES
William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.
No Drawing. Continuation-in-part of abandoned application Ser. No. 4,397, Jan. 20, 1970. This application June 24, 1971, Ser. No. 156,459
Int. Cl. C07c *103/22*
U.S. Cl. 260—558 R **23 Claims**

Bis(trifluoromethyl)benzamides and bis(trifluoromethyl)-N-substituted benzamides, e.g., 2,4-bis(trifluoromethyl)benzamide, are prepared from bis(trifluoromethyl) benzoic acids and are useful as central nervous system depressants and coccidiostats.

3,825,595
N-CYCLOPENTYL-N-2-HYDROXYALKYL-RING-SUBSTITUTED BENZAMIDES
William D. Roll, Toledo, Ohio, assignor to The University of Toledo, Toledo, Ohio
No Drawing. Continuation-in-part of abandoned application Ser. No. 123,842, Mar. 12, 1971. This application May 15, 1972, Ser. No. 253,520
Int. Cl. C07c *103/22*
U.S. Cl. 260—558 R **8 Claims**

Simultaneously acting central nervous system (CNS) depressants and blood pressure depressors of the formula



wherein R is selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, and halogen radicals; and wherein x is a whole number from one to three.

3,825,596
PROCESS FOR PREPARATION OF N,N-DIALKYL TOLUAMIDE
Taketosi Naito, Kawasaki, and Masatomo Ito, Yokohama, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan
No Drawing. Filed May 23, 1972, Ser. No. 256,116
Int. Cl. C07c *103/22*
U.S. Cl. 260—558 R **3 Claims**

N,N-Dialkyl-m(or p)-toluamide can be produced by reacting m(or p)-tolunitrile with di- or trialkylamine and water in the liquid phase. Remarkably superior results can be obtained by using specific compounds as catalysts and/or removing ammonia formed during the reaction from the system.

3,825,597
THIOPSEUDOURONIUM COMPOUNDS
Julius Diamond, Lafayette Hill, Pa., assignor to William H. Rorer, Inc., Fort Washington, Pa.
No Drawing. Original application May 10, 1971, Ser. No. 142,038. Divided and this application Dec. 26, 1972, Ser. No. 318,148
Int. Cl. C07c *123/00*
U.S. Cl. 260—564 E **17 Claims**

Novel thiopseudouronium compounds have been prepared. Compounds of this invention possess useful gastric anti-secretory, spasmolytic and anti-ulcerogenic properties. A method of treating gastrointestinal hyperacidity and ulceration has also been disclosed.

3,825,598
PROCESS FOR THE PRODUCTION OF POLYAMINES
Willi Eifler, Schildgen, and Josef Finkel, Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany
Filed June 21, 1972, Ser. No. 265,054
Claims priority, application Germany, July 7, 1971, P 21 33 870.5
Int. Cl. C07c *85/08*
U.S. Cl. 260—570 D **7 Claims**

A continuous process for the production of diamine-rich mixtures of polyamines of the polyamino-polyarylpolymethylene type obtained by condensing aromatic amines with formaldehyde or formaldehyde precursors.

3,825,599
PERFLUOROMETHYLPROPIONYLKETENE
David C. England, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed June 28, 1972, Ser. No. 267,126
Int. Cl. C07c *49/22*
U.S. Cl. 260—585.5 **4 Claims**

2-(Trifluoromethyl)perfluoropentene-2 reacts with an alkali metal lower alkoxide to give cis- and trans-alkyl-2-(trifluoromethyl)-1,1,4,4,5,5,5 - heptafluoro-3-alkoxypent-2-enyl ether which is then reacted with sulfur trioxide to give perfluoromethyl propionylketene. On contacting perfluoromethylpropionylketene with an alkali metal fluoride in a polar solvent between room temperature and 150° C., three products are obtained, the proportions varying with the conditions. With a catalytic amount of alkali metal fluoride or silver oxide the product is mainly a dimer below 60° C. Above 60° C. a pyranopyran-2,5-dione is formed. If an equi-molar amount of alkali metal fluoride is employed the product is a metal derivative of pyran-4-one.

Perfluoromethylpropionylketene and the above derivatives are all useful as waterproofing agents for textiles and paper.

Also disclosed is a method of separating perfluoromethylpropionylketene from by-product alkyl sulfonates by contacting the mixed vapors with an alkali metal fluoride at 250° C. to 700° C.

3,825,600
PROCESS FOR THE PREPARATION OF UNSATURATED CARBONYL COMPOUNDS
Takashi Ohara and Michio Ueshima, Nishinomiya, and Isao Yanagisawa, Ikeda, Osaka, Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan
No Drawing. Filed May 25, 1971, Ser. No. 146,848
Int. Cl. C07c *45/02*
U.S. Cl. 260—604 R **4 Claims**

A process for the preparation of unsaturated carbonyl compounds which comprises catalytically by oxidizing an olefin selected from the group consisting of propylene and isobutylene in the vapor phase in the presence of catalytic oxide in which the atomic ratio among the constituent metallic elements, Co:Fe:Bi:W:Mo:Si:Z is within the range of 2.0–20.0:0.1–10.0:0.1–10.0:5–10.0:2.0–11.5:0.5–15.0:0.005–1.0, with the proviso that W plus Mo equals 12.0, and Z stands for an alkali metal.

3,825,601
HYDROFORMYLATION OF INTERNAL OLEFINS
Leonard E. Rennick, Philadelphia, Pa., assignor to Sun Oil Company, Philadelphia, Pa.
No Drawing. Filed Dec. 22, 1970, Ser. No. 100,804
Int. Cl. C07c *45/08*
U.S. Cl. 260—604 HF **6 Claims**

Hydroformylation of internal olefins, as opposed to terminal olefins, to produce linear aldehydes in improved

yields, is achieved by the addition of a sulfonic acid-type ion exchange resin to catalysts of the formula

$$Rh(H)(CO)(Ph_3P)_3,$$

where Ph is phenyl.

3,825,602

CERTAIN GERANYL PHENYL ETHERS AND THEIR EPOXIDES AND THEIR USE IN CONTROLLING INSECTS

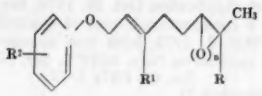
Ferenc M. Pallos, Pleasant Hill, Hwalin Lee, Palo Alto, and Julius J. Menn, Saratoga, Calif., assignors to Stauffer Chemical Company, New York, N.Y.

No Drawing. Application Sept. 8, 1969, Ser. No. 856,140, which is a continuation-in-part of abandoned application Ser. No. 815,229, Apr. 10, 1969. Divided and this application Feb. 7, 1972, Ser. No. 224,263

Int. Cl. C07c *43/20, 149/00*

U.S. Cl. 260—609 R **20 Claims**

Compounds having the formula



in which R and R^1 are independently methyl or ethyl; *n* is the integer zero or one; R^2 is hydrogen, lower alkyl, lower alkenyl, lower alkoxy, halogen, nitro, lower alkylthio, or certain heterocyclic radicals; the use of these compounds in controlling insects; and a method of preparing certain intermediates which are useful in preparing certain of the compounds.

3,825,603

PREPARATION OF ETHERS

Stephen N. Massie, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Feb. 22, 1972, Ser. No. 228,351

Int. Cl. C07c *41/06*

U.S. Cl. 260—612 D **9 Claims**

Symmetrical and unsymmetrical ethers may be prepared by the addition of an olefin to an alcohol in the presence of a catalyst comprising a vanadium-containing compound at reaction conditions which include a temperature in the range of from about 50° to about 300° C. and a pressure in the range of from about atmospheric to about 100 atmospheres.

3,825,604

PROCESS FOR PREPARING CATECHOL AND HYDROQUINONE

Katsuto Matsuzawa, Akira Matukuma, and Iwao Takagishi, Tokyo, and Kenji Yoshida, Kawasaki, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

No Drawing. Filed Dec. 20, 1971, Ser. No. 210,214

Claims priority, application Japan, Dec. 30, 1970, 46/125,873

Int. Cl. C07c *37/00*

U.S. Cl. 260—621 G **11 Claims**

Catechol and hydroquinone can be advantageously manufactured on an industrial scale by oxidizing phenol with hydrogen peroxide, wherein the concentration of phenol feed is adjusted to above 10%, by weight, based on the total weight of feed, in the presence of an iron catalyst compound wherein the concentration of iron compound is adjusted to below 1 mole percent based on the phenol.

3,825,605

OXIDATION OF ISOPARAFFINS TO TERTIARY ALCOHOLS

Byron E. Johnston, Califon, N.J., assignor to Mobil Oil Corporation

No Drawing. Filed Aug. 2, 1971, Ser. No. 168,429

Int. Cl. C07c *27/12, 31/12*

U.S. Cl. 260—632 C **7 Claims**

A process for effecting the liquid phase oxidation of an isoparaffin, such as isobutane, to the corresponding tertiary alcohol. The reaction is conducted in the presence of a catalyst having the following formula:

$$M_{m/n}M'_xM''_yO_w$$

wherein M is cobalt or chromium, M′ is selected from the group consisting of cobalt, manganese, iron, chromium and aluminum, M″ is molybdenum or tungsten, *w* represents the number of oxygen atoms and *m* and *n* represents the charge on the anion and cation respectively from which the catalyst is derived and will be described hereinafter. These catalysts may be employed with a suitable support such as alumina.

3,825,606

FLUOROCYCLOPROPANES AS INHALATION ANESTHETICS

Gerald J. O'Neill, Arlington, Charles W. Simon, Bedford, and Charles A. Billings, Concord, Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

No Drawing. Filed June 2, 1972, Ser. No. 258,957

Int. Cl. C07c *23/04*

U.S. Cl. 260—648 F **1 Claim**

New compounds 1-chloro-1,2,2-trifluorocyclopropane and 1-bromo-2,2-difluorocyclopropane have been found useful as general inhalation anesthetics.

3,825,607

SYNTHESIS OF 1-BROMO-TRANS-3, TRANS-5-HEPTADIENE

Charles E. Descoins and Clive A. Henrick, Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

No Drawing. Filed Jan. 17, 1972, Ser. No. 218,512

Int. Cl. C07c *21/14*

U.S. Cl. 260—654 R **1 Claim**

1-Halo-3,5-heptadiene, prepared by the action of aqueous hydrohalic acid on 1-cyclopropyl-2-buten-1-ol which may be prepared by a Grignard reaction between crotonaldehyde and cyclopropyl magnesium halide or between cyclopropyl cyanide and 1-propynyl magnesium halide. It is useful in preparing 8,10-dodecadienol, a known codling moth sex attractant.

3,825,608

STABILIZED HALOGENATED HYDROCARBONS

Kestutis A. Keblys, Southfield, Mich., assignor to Ethyl Corporation, Richmond, Va.

No Drawing. Filed Aug. 10, 1972, Ser. No. 279,439

Int. Cl. C07c *17/40*

U.S. Cl. 260—652.5 R **3 Claims**

Polybrominated hydrocarbons are stabilized by orthoesters such as orthoformates, orthoacetates, orthothioformates and orthothioacetates. For example, acetylene tetrabromide is stabilized with triethyl orthoformate and triethyl orthoacetate.

3,825,609

MANUFACTURE OF 1,1,1-TRICHLOROETHANE

Alastair Campbell and Allan Thoburn, Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Sept. 28, 1970, Ser. No. 75,838

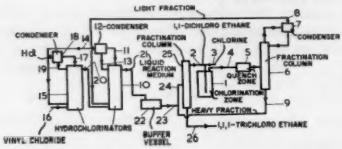
Claims priority, application Great Britain, Oct. 15, 1969, 50,715/69

Int. Cl. C07c *17/00*

U.S. Cl. 260—658 R **4 Claims**

In the manufacture of 1,1,1-trichloroethane by the chlorination of 1,1-dichloroethane, a light fraction from

the chlorinator exit gases comprising vinyl chloride, vinylidene chloride and hydrogen chloride is passed to a hydrochlorination zone and a vinyl chloride feedstock is hydrochlorinated in a separate hydrochlorination zone.



The interlocking steps have the advantage that the two reactions can be effectively controlled and there is practically complete consumption of byproducts of the reaction to give desired products.

3,825,610
SELECTIVE HYDROGENATION OF NAPHTHALENES

Ryuichi Sonoda and Tadayuki Ohmae, Niihama, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

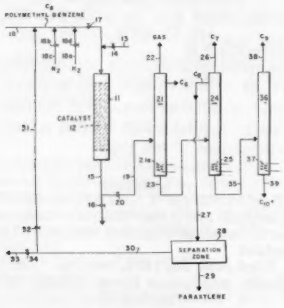
No Drawing. Filed June 19, 1972, Ser. No. 264,086
Claims priority, application Japan, June 19, 1971, 46/44,098
Int. Cl. C07c *5/10*
U.S. Cl. 260—667 **5 Claims**

An improved process for the selective hydrogenation of alkylnaphthalenes or naphthalene to alkyltetrahydronaphthalene or tetrahydronaphthalene comprising using a fixed bed of a hydrodesulfurization catalyst, and an organic compound as a diluent which is quite soluble in the alkylnaphthalenes and naphthalene and is volatile under the hydrogenation reaction conditions is disclosed.

3,825,611
ISOMERIZATION OF POLYMETHYLBENZENES

Edward F. Wadley and Robert D. Wesselhoft, Baytown, Tex., and Glen P. Hamner, Baton Rouge, La., assignors to Esso Research and Engineering Company, Linden, N.J.

Filed Dec. 16, 1970, Ser. No. 98,522
Int. Cl. C07c *5/24, 15/08*
U.S. Cl. 260—668 A **16 Claims**



Non-equilibrium mixtures of polymethylbenzenes such as ortho-, meta-, and paraxylene, ethylbenzene, the trimethylbenzenes and the tetramethylbenzenes, and the like are isomerized by contacting them in the vapor phase with a catalyst comprising a noble metal on a crystalline alumino-silicate base such as $H_2CaK_2Na_2Al_2Si_6O_{17}\cdot 5H_2O$, or the synthetic crystalline aluminosilicate having a composition expressed in terms of mol ratios of oxides, as follows:

$$1.0\pm 0.1[(1-X)K_2O:(X)(N(CH_3)_4)_2O]\cdot Al_2O_3:6.5\pm 1.0SiO_2:YH_2O$$

wherein X has a value of from about 0.001 to about 0.2, and Y has a value from 0 to about 10, said zeolite base being in the form of the corresponding hydrogen zeolite which is impregnated or exchanged with a sufficient amount of an aqueous solution of specific noble metal isomerization component to form a catalyst on drying.

3,825,612
DEHYDROGENATION WITH A MULTICOMPONENT CATALYST

Frederick C. Wilhelm, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

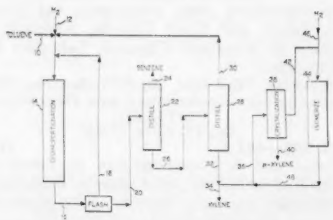
No Drawing. Application Oct. 16, 1970, Ser. No. 81,512, which is a continuation-in-part of application Ser. No. 15,960, Mar. 2, 1970, both now abandoned. Divided and this application Nov. 3, 1972, Ser. No. 303,470
Int. Cl. C07c *5/24*
U.S. Cl. 260—668 D **23 Claims**

Dehydrogenatable hydrocarbons are dehydrogenated by contacting them at dehydrogenation conditions with a catalytic composite comprising a combination of catalytically effective amounts of a platinum group component, a nickel component, a Group IVA metallic component and an alkali or alkaline earth component with a porous carrier material. A specific example of the disclosed dehydrogenation method is a method for dehydrogenating a dehydrogenatable hydrocarbon comprising contacting the hydrocarbon at dehydrogenation conditions with a catalyst comprising a combination of a platinum component, a nickel component, a germanium component and an alkali or alkaline earth component with an alumina carrier material. The amounts of the catalytically active components contained in this last composite are, on an elemental basis, 0.01 to 2 wt. percent platinum, 0.01 to 5 wt. percent nickel, 0.01 to 5 wt. percent germanium and 0.1 to 5 wt. percent of the alkali or alkaline earth metal.

3,825,613
ALKYL TRANSFER OF ALKYL AROMATICS WITH CHROMIUM OR VANADIUM AND MANGANESE AND TIN METALS ON MORDENITE

Ronald A. Kmecak and Stephen M. Kovach, Ashland, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Apr. 10, 1972, Ser. No. 242,758
Int. Cl. C07c *3/62*
U.S. Cl. 260—672 T **10 Claims**



Alkyl transfer, such as disproportionation, of alkyl aromatics is accomplished by contacting an alkyl aromatic feed material with a catalyst comprising chromium or

vanadium and promoter consisting of a mixture of tin and manganese all supported on a synthetic mordenite.

3,825,614

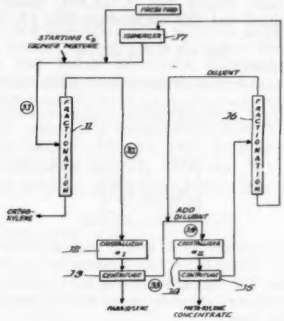
RECOVERY OF META-XYLENE BY SELECTIVE CRYSTALLIZATION

Alan G. Bemis, John K. Darin, and Melvern C. Hoff, Naperville, Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Aug. 11, 1972, Ser. No. 279,854

Int. Cl. C07c 7/14

U.S. Cl. 260—674 A **22 Claims**



A process is provided for selectively separating meta-xylene from a mixture of C_8 isomers by establishing a unique set of process conditions in which para-xylene is crystallized at an unexpectedly low rate relative to the rate at which metaxylene is crystallized. By preparing a mixture of C_8 isomers containing: (1) a substantially eutectic mixture of meta- and para-xylene, (2) an adjusted ortho-xylene concentration to a level below the eutectic ratio of ortho- and meta-xylene, and (3) an adjusted para-xylene concentration of about 10 mole percent or less para-xylene in the mixture, and by cooling this mixture at a temperature and for a time sufficiently short to provide a slurry of crystals enriched in meta-xylene relative to the ratio of meta- and para-xylene normally obtained in crystallization to thermodynamic equilibrium, the recovery of high purity meta-xylene can be effected.

3,825,615

ETHYLENE OLIGOMERIZATION PROCESS

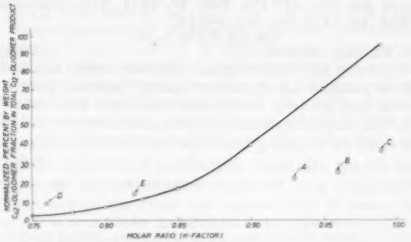
Eugene F. Lutz, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sept. 24, 1973, Ser. No. 400,486

Int. Cl. C07c 3/10

U.S. Cl. 260—683.15 D **9 Claims**

A process is described for oligomerizing ethylene to a mixture of higher, linear, alpha-olefins having a molecular weight distribution which differs substantially from the geometric distribution pattern conventionally obtained in that the product is made up in large proportion of oligomers in the intermediate or C_{12} to C_{42} carbon number range while the relative quantity of higher oligomers of more than 42 carbon atoms is substantially reduced. This process comprises reacting ethylene in a solvent selected from the class consisting of alpha, omegaalkandiols of 4 to 7 carbon atoms and alkylene carbonates of 3 to 7 carbon atoms in the presence of a catalyst composition produced by contacting in the presence of ethylene (1)



a simple divalent nickel salt, (2) a boron hydride reducing agent and (3) dicyclohexylphosphinopropionic and/or an alkali metal salt thereof.

3,825,616

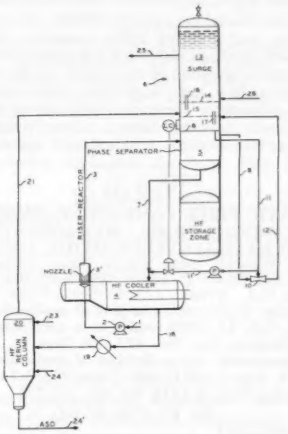
TREATING ALKYLATE-CONTAINING HYDROCARBON WITH HF IN A UNITARY VESSEL

Charles C. Chapman, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Sept. 3, 1971, Ser. No. 177,586

Int. Cl. C07c 3/54

U.S. Cl. 260—683.48 **6 Claims**



Upon separation of an alkylation effluent from an isoparaffin-olefin hydrogen fluoride alkylation into a hydrocarbon phase and an acid phase, the hydrocarbon phase, containing organic fluorides, is contacted with relatively pure HF resulting from a rerun or purification of HF in the presence of isoparaffin which acts to convert and, therefore, to reduce organic fluoride content of the HF being rerun. Additional rerun HF substantially free from or having a considerably reduced organic fluoride content can be used to further reduce organic fluoride in said hydrocarbon phase.

3,825,617
METHOD FOR STARTING UP AN ALKYLATION SYSTEM

George L. Hervert, Woodstock, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Continuation-in-part of abandoned application Ser. No. 117,158, Feb. 19, 1971. This application Mar. 16, 1973, Ser. No. 342,107

Int. Cl. C07c *3/54*

U.S. Cl. 260—683.48 **4 Claims**

A process for starting up an isobutane-olefin alkylation unit to produce an alkylation reaction product from isobutane and a C_3–C_5 olefin using hydrogen fluoride catalyst. The alkylation reactor, settler, and isobutane stripper are dried by recycling isobutane therethrough at the rate used during alkylation operations. Circulation of fresh, substantially pure hydrogen fluoride through the reactor and settler is then started, the isobutane recycle rate to the reactor is reduced to a low level, olefin feed is charged to the reactor, and the reactor temperature is maintained at about 115° F. to 200° F. for about 0.1 hour to about 48 hours. During this period of high temperature, low isobutane recycle operation, the hydrogen fluoride is diluted to about 90 weight percent purity with soluble organic compounds. The reactor temperature is then reduced to about 50° F. to about 110° F., the isobutane recycle rate is increased to the original level, and normal alkylation operations are commenced.

3,825,618
CURABLE ORGANOPOLYSILOXANES

Anthony Enrico Pepe, Sylvania, Ohio, assignor to Stauffer Chemical Company

No Drawing. Continuation of abandoned application Ser. No. 780,290, Nov. 29, 1968. This application Dec. 10, 1970, Ser. No. 97,021

Int. Cl. C08g *47/00*

U.S. Cl. 260—827 **19 Claims**

A curable organopolysiloxane composition comprising a hydroxyl-terminated organopolysiloxane, an organometallic catalyst, and a curing agent consisting of polyfunctional silanes or siloxanes having a terminal group selected from the class consisting of an oxirane, cyano radical, and a carboxyl radical and, if desired, polyalkoxysilanes or polyalkoxysiloxanes. These organopolysiloxane compositions will result in a cured silicone rubber having improved elongation, tear strength, and reduced durometer.

3,825,619
ANTISTATIC FIBER CONTAINING HIGH MOLECULAR WEIGHT TRIS(B - HYDROXYALKYL)-ISOCYANURATE-ALKYLENE OXIDE ADDUCTS

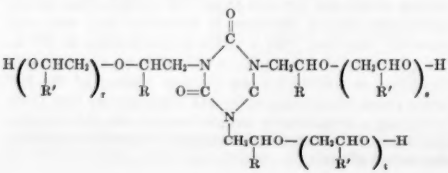
Gene C. Weedon, 5431 Lingle Lane, Richmond, Va. 23234, and Edwin D. Little, 505 Pitney Place, Convent Station, N.J. 07961

No Drawing. Continuation-in-part of application Ser. No. 80,488, Oct. 13, 1970, which is a continuation-in-part of application Ser. No. 873,689, Nov. 3, 1969, both now abandoned, and a division of application Ser. No. 215,974, Jan. 3, 1972, now Patent No. 3,741,966. This application Mar. 5, 1973, Ser. No. 337,778

Int. Cl. C08g *41/04*

U.S. Cl. 260—857 **5 Claims**

It has been found that an antistatic fiber of polyamide or polyester can be prepared by uniformly dispersing in the polymer between about 1 percent and about 10 percent of a compound represented by the formula



wherein R and R′ are independently at each occurrence hydrogen, methyl or ethyl and *r*, *s*, and *t* are integers from 31 to about 200. Preferably, the compound is a block copolymer of ethylene oxide, propylene oxide and tris(B-hydroxyethyl)isocyanurate having a molecular weight greater than 9,000, with the ethylene oxide moiety making up 10 to 95 percent of the molecular weight of the compound.

3,825,620
ABA BLOCK POLYMERS OF POLYESTER AND POLYETHERS

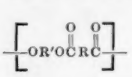
Joseph Victor Koleske, Rene Marie-Joseph Roberts, and Frank Paul Del Giudice, Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Original application Dec. 30, 1970, Ser. No. 102,924, now Patent No. 3,725,352, dated Apr. 3, 1973. Divided and this application Oct. 17, 1972, Ser. No. 298,378

Int. Cl. C08g *39/10*

U.S. Cl. 260—873 **3 Claims**

The invention relates to novel, solid, substantially water-insoluble ABA block polymers in which the A blocks comprise recurring linear units of the formula



wherein the substituents R and R′ are divalent aliphatic groups and in which the B block comprises recurring oxyalkylene units.The block polymers have utility as plasticizers for polyvinyl chloride resins and as dye assists for polypropylene fiber.

3,825,621
METHOD OF GRAFT POLYMERIZATION AND POLYMERS PRODUCED THEREBY

Emory A. Ford, Hampden, Mass., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Aug. 3, 1972, Ser. No. 277,758

Int. Cl. C08f *15/00*

U.S. Cl. 260—878 R **10 Claims**

A rubber modified polymer blend is prepared from a relatively small particle elastomer which is agglomerated to a particle size of about 0.2 to 1.0 micron by admixture with a more hydrophilic polymer at a pH of about 3.0 to 10.5. Following agglomeration, the latex is admixed with a vinylidene monomer formulation and grafting conditions are established to produce polymerization of the vinylidene formulation and grafting of at least a portion of the polymer being formed onto the agglomerated elastomer. The elastomer should have a glass transition temperature below 100° Centigrade and the agglomeration takes place at a temperature of 0° to 100° Centigrade and above the glass transition temperature of the elastomer.

3,825,622
IMPACT MODIFIED BLENDS OF VINYL CHLORIDE POLYMERS, LACTONE GRAFT COPOLYMERS AND STYRENE-DIENE-STYRENE BLOCK COPOLYMERS

Lloyd M. Robeson, Lebanon, and Louis A. Pilato, Bound Brook, N.J., and Robert E. Godlewski, Mahopac, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Nov. 20, 1972, Ser. No. 307,843

Int. Cl. C08f *15/00, 19/00*

U.S. Cl. 260—876 B **7 Claims**

Vinyl chloride polymer compositions having a Masland cold crack test value of about −30° C. have been provided by combining lactone graft copolymers together with a styrene-diene-styrene block copolymer.

3,825,623

PROCESS FOR PREPARING BLOCK COPOLYMERS OF ALPHA METHYL STYRENE AND CONJUGATED DIOLEFINS

Ronald Turner La Flair, Sarnia, Ontario, Canada, assignor to Polysar Limited, Sarnia, Ontario, Canada

No Drawing. Continuation-in-part of abandoned application Ser. No. 713,301, Mar. 15, 1968. This application May 7, 1971, Ser. No. 141,395

Claims priority, application Canada, Apr. 1, 1967, 486,797; Jan. 25, 1968, 10,718

Int. Cl. C08f *19/00, 19/06, 19/08*

U.S. Cl. 260—879 8 Claims

Improved thermoplastic rubbery block copolymers have terminal blocks of polyalphamethylstyrene and at least one non-terminal block of an elastomeric polymer, such as butadiene or isoprene.

3,825,624

WATER-SOLUBLE SIZING AGENT

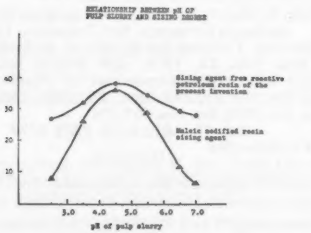
Kakichi Hirai, Ninomiya-machi, Hideo Hayashi, Yokohama, and Yoichi Hiratsuka, Kawasaki, Japan, assignors to Nippon Petrochemicals Co., Ltd., Tokyo, Japan

Continuation-in-part of application Ser. No. 681,195, Nov. 7, 1967, which is a continuation-in-part of application Ser. No. 281,448, May 10, 1963, both now abandoned. This application Jan. 21, 1972, Ser. No. 219,646

Claims priority, application Japan, May 23, 1962, 37/20,378

Int. Cl. C08f *19/00*

U.S. Cl. 260—879 2 Claims



A water-soluble sizing agent obtained by reacting the resin with unsaturated carboxylic acid; said resin being prepared by polymerizing hydrocarbon mixture of a thermally cracked petroleum oil fraction having an unsaturated aromatic hydrocarbon content in the range of 15 to 80% by weight and conjugated diolefin content in the range of 20 to 85% by weight in the presence of boron triflouride catalyst.

3,825,625

PROCESS FOR PRODUCING HIGH IMPACT RESISTANCE RESINS

Teizo Kudo, Ohimachi, and Saizo Ikeda, Yuzo Sonoyama, and Motoharu Kotani, Sakai, Japan, assignors to Daicel Ltd., Osaka, Japan

Filed Dec. 27, 1971, Ser. No. 212,616

Claims priority, application Japan, Dec. 30, 1970, 46/122,234

Int. Cl. C08f *1/04, 1/11, 19/08*

U.S. Cl. 260—880 R 6 Claims

Pearl-like spherical thermoplastic resin beads having a high impact resistance and of a controlled relatively small particle size are made by subjecting a mixture or a solution of a rubber elastomer in an aromatic monoalkenyl monomer or a mixture of an aromatic monoalkenyl monomer and a copolymerizable monovinyl monomer to a bulk-suspension two stage polymerization process. A predetermined amount of a metallic soap or an alkylene bis fatty acid amide is added to the mixture or solution before the start of the bulk polymerization in an amount within the range of 0.001 to 0.5% by weight.

3,825,626

ETHYLENE POLYMER COMPOSITION HAVING ENHANCED PHOTODEGRADABILITY

Michael Calvin McGaugh, Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed July 6, 1971, Ser. No. 160,139

Int. Cl. C08f *15/04*

U.S. Cl. 260—897 A 5 Claims

Photodegradability of ethylene polymer containing a photosensitizing material is enhanced by incorporating therein a minor amount of polypropylene. The resultant photodegradable blends are useful as molding or extrusion compositions for the production of disposable plastic articles, e.g., wrappings, containers, etc., which degrade rapidly when exposed to sunlight and other ultraviolet light sources.

3,825,627

ETHYLENE POLYMER COMPOSITION HAVING ENHANCED PHOTODEGRADABILITY

Michael C. McGaugh, Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 160,139, July 6, 1971. This application May 30, 1972, Ser. No. 257,831

Int. Cl. C08f *15/04*

U.S. Cl. 260—897 A 14 Claims

Photodegradability of ethylene polymer containing a photosensitizing material such as tris(N,N-di-n-butyldithiocarbamato)iron (III) is enhanced by incorporating therein a minor amount of polypropylene. The resultant photodegradable blends are useful as molding or extrusion compositions for the production of disposable plastic articles, e.g., wrappings, containers, etc., which degrade rapidly when exposed to sunlight and other ultraviolet light sources.

3,825,628

PASTES CONTAINING ACID, AMINES AND PHOSPHORIC ACID ESTERS

Gerhard Mietens, Efferen, Gerd Kohler, Junkersdorf, Hans Haas, Knapsack, and Hilmar Roszinski, Hurth-Kendenich, Germany, assignors to Knapsack Aktiengesellschaft, Knapsack, near Cologne, Germany

No Drawing. Filed Feb. 24, 1971, Ser. No. 118,523

Claims priority, application Germany, Mar. 21, 1970, P 20 13 627.0

Int. Cl. C07f *9/02*

U.S. Cl. 260—920 7 Claims

Pastes containing acids and long-chain amines in combination with between 0.1 and 25 weight percent of one or more phosphoric acid esters, based on the paste, and process for making such pastes.

3,825,629

BENZENE PHOSPHONATES

Kurt Hofer, Munchenstein, Basel-Land, and Guenther Tscheulin, Riehen, Basel-Stadt, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

No Drawing. Filed Oct. 20, 1971, Ser. No. 191,079

Claims priority, application Switzerland, Oct. 22, 1970, 15,605/70; June 30, 1971, 9,597/71

Int. Cl. C07d *105/04;* C07f *9/46*

U.S. Cl. 260—932 10 Claims

The purpose of the invention are new benzene phosphonic acid compounds in which two to four benzene nuclei are bound together and which contain one to three phosphorus atoms. The new compounds are free acids, their salts with inorganic cations, their esters, thioesters or amides. The invention concerns also the manufacture of these benzene phosphonic acid compounds and their use for the stabilization of organic materials.

3,825,630
PHOSPHONATE CARBAMATES

Stephen B. Sello, Cedar Grove, and Bernard J. Gaj, Montclair, N.J., assignors to J. P. Stevens & Co., Inc., New York, N.Y.

No Drawing. Original application June 18, 1971, Ser. No. 154,690, now Patent No. 3,758,554. Divided and this application Apr. 30, 1973, Ser. No. 355,837

Int. Cl. C07f *9/40*

U.S. Cl. 260—938 **3 Claims**

This invention relates to phosphorus-containing carbamates having at least one N-methylol or N-alkoxymethyl group. These compounds can be used to impart durable flame-retardant properties to cellulose-containing substrates.

3,825,631
ACETYL-BUTYL-CIS-1-PROPENYL PHOSPHONATE

Burton G. Christensen, Scotch Plains, N.J., and William J. Leanza, Staten Island, N.Y., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Original application May 15, 1968, Ser. No. 729,388, now Patent No. 3,625,982. Divided and this application Dec. 1, 1970, Ser. No. 94,176

Int. Cl. A01n *9/36;* **C07f** *9/40*

U.S. Cl. 260—941 **1 Claim**

A new class of *cis*-1-propenyl-phosphinite derivatives are disclosed. These products are useful as intermediates in the preparation of (±) and (—) (*cis*-1,2-epoxypropyl)phosphonic acids which have utility as antibiotics.

3,825,632
PHOSPHORUS-CONTAINING AMIDINES

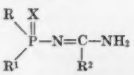
Ferenc M. Pallos, Pleasant Hill, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Original application Dec. 15, 1969, Ser. No. 885,263, now Patent No. 3,734,980. Divided and this application July 24, 1972, Ser. No. 274,553

Int. Cl. C07f *9/24, 9/36, 9/44*

U.S. Cl. 260—944 **3 Claims**

Compounds of the formula:



in which R is lower alkyl or lower alkoxy; R^1 is lower alkoxy or lower alkylthio; R^2 is hydrogen, lower alkyl, phenyl; mono or di-substituted phenyl; and X is oxygen when R^1 is lower alkylthio and sulfur when R^1 is lower alkoxy as insecticides and acaricides, and a process for preparing the compounds above having X be oxygen.

3,825,633
PHOSPHORODITHIOLATES

Hiroshi Tsuchiya, Ashiya, Kunio Mukai, Nishinomiya, Akio Kimura, Takarazuka, Keimei Fujimoto, Kyoto, Toshiaki Ozaki and Sigeo Yamamoto, Toyonaka, Yositosi Okuno, Nishinomiya, Taizo Ogawa, Minoo, Toshiyuki Wakatsuki, Kyoto, and Yoshihiko Nishizawa, Nara, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

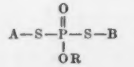
No Drawing. Application Aug. 5, 1970, Ser. No. 61,468, now Patent No. 3,725,546, which is a continuation-in-part of abandoned application Ser. No. 690,725, Dec. 15, 1967. Divided and this application Nov. 21, 1972, Ser. No. 308,585

Claims priority, application Japan, Dec. 20, 1966, 41/83,746; Feb. 18, 1967, 42/10,576; Mar. 10, 1967, 42/15,087

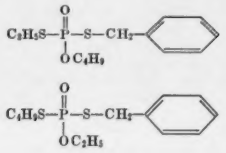
Int. Cl. A01n *9/36;* **C07f** *9/16*

U.S. Cl. 260—956 **1 Claim**

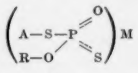
Method for controlling insects and fungi, in which the insects and fungi are contacted with a phosphorodithiolate of the formula,



wherein R is a lower alkyl; A is a lower alkyl, etc.; and B is phenylalkyl, etc. Two typical examples of the phosphorodithiolates are shown by the formula



The compounds can be prepared by condensing a dithioate of the formula,



wherein A and R are as mentioned above M is an alkali metal or ammonium group, with a halide of the formula,

B·Hal

wherein B is as mentioned above and Hal is halogen.

3,825,634
N-ARALKANOYL AND N-ARALKENOYL DERIVATIVES OF O,S - DIHYDROCARBYLPHOSPHOROAMIDOTHIOATES AND S,S - DIHYDROCARBYLPHOSPHOROAMIDODITHIOATES

Philip S. Magee, Ignatio, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Continuation-in-part of application Ser. No. 13,846, Feb. 24, 1970, now Patent No. 3,716,600, which is a continuation-in-part of abandoned application Ser. No. 810,383, Mar. 25, 1969. This application Dec. 21, 1972, Ser. No. 317,476

Int. Cl. A01n *9/36;* **C07f** *9/24*

U.S. Cl. 260—956 **6 Claims**

N-aralkanoyl and N-aralkenoyl derivatives of S,S-dihydrocarbyl phosphoroamidodithioates and O,S-dihydrocarbylphosphoroamidothioates have a high degree of insecticidal activity with relatively low mammalian toxicity.

3,825,635
2-CHLOROETHANE-(THIONO)-PHOSPHONIC ACID AMIDO ESTERS

Wolfgang Hofer, Wuppertal-Vohwinkel, Reinhard Schliebs, Cologne, Robert Schmidt, Leverkusen, and Ludwig Eue, Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

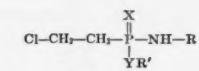
No Drawing. Filed Mar. 1, 1971, Ser. No. 119,912

Claims priority, application Germany, Mar. 4, 1970, P 20 10 119.3

Int. Cl. C07f *9/40, 9/42, 9/44*

U.S. Cl. 260—959 **17 Claims**

Certain novel 2-chloroethane-(thiono)-phosphonic acid amido compounds of the formula



in which

X and Y, which may be the same or different, are oxygen or sulfur,

R is hydrogen or alkyl, and

R′ is alkyl, or, if R is hydrogen or Y is sulfur,

R′ may additionally be phenyl which may be substituted by hydroxy, (lower) alkyl, halogen or nitro.

possess marked plant growth regulant properties, e.g., selective herbicidal activity, growth promoting and growth altering properties.

3,825,636

O-ETHYL S-PROPYL-DITHIOPHOSPHORIC ACID PHENYL OR NAPHTHYL ESTERS

Shigeo Kishino, Tokyo, Akio Kudamatsu, Kanagawa-ken, Iwao Takase, Tokyo, Kozo Shiokawa, Kanagawa-ken, and Shin-Ichi Yamaguchi, Tokyo, Japan, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

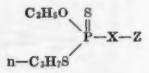
No Drawing. Filed Mar. 10, 1971, Ser. No. 123,087

Claims priority, application Japan, Mar. 13, 1970, 45/20,845

Int. Cl. A01n *9/36;* C07f *9/18*

U.S. Cl. 260—964 7 Claims

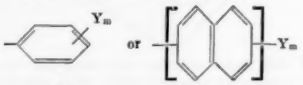
O-ethyl-S-n-propyl-dithiophosphoric acid phenyl or naphthyl esters, i.e. O-ethyl-S-n-propyl-O- or S-optionally substituted phenyl or naphthyl-phosphorothionothiol- or dithiolates, of the formula



(I)

in which

X is an oxygen or sulfur atom, and
Z is a group of the formula



(IIa) (IIb)

Y is a halogen atom or a lower alkyl, lower alkoxy, lower alkylmercapto, lower alkylsulfinyl, nitro, cyano or phenyl group, and
m is 0, 1, 2 or 3,

which possess insecticidal, acaricidal and nematocidal properties.

3,825,637

INJECTION MOLDING OF FOAM CORED SANDWICH STRUCTURES

Maurice Henry Robin, Alderley Edge, England, assignor to Imperial Chemical Industries Limited, London, England

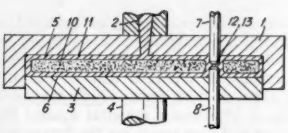
Continuation-in-part of application Ser. No. 93,917, Nov. 30, 1970, now Patent No. 3,767,742, which is a continuation of abandoned application Ser. No. 747,328, July 24, 1968. This application May 3, 1971, Ser. No. 139,776

Claims priority, application Great Britain, July 26, 1967, 34,400/67; Apr. 30, 1968, 20,470/68

The portion of the term of the patent subsequent to Oct. 23, 1990, has been disclaimed

Int. Cl. B29d *9/00, 27/00;* B32b *7/02*

U.S. Cl. 264—55 11 Claims



Injection molded solid skinned foam core sandwich structures are made using an enlargeable mold. During the molding operation, thin, non-foamed portions, such as hinges, or areas which can subsequently be removed to provide orifices in the molding, are made after the mold cavity has been filled with the foamable composition by effecting relative movement between a tool defining the non-foamed portion and one of the opposed surfaces of the mold.

3,825,638

METHOD FOR PRODUCING COLD BOUND AGGLOMERATES FROM PARTICULATE MINERAL CONCENTRATES

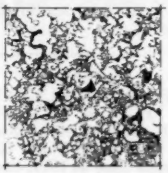
Per Gudmar Kihlstedt, Bromma, Sweden, assignor to AB Cold-Bound Pellets, Djursholm, Sweden

Filed Oct. 14, 1971, Ser. No. 189,080

Claims priority, application Sweden, Oct. 19, 1970, 14,096/70

Int. Cl. C04b

U.S. Cl. 264—63 17 Claims



A method for producing cold bound agglomerates from particulate iron oxide containing mineral concentrates using a steam hardenable binder. The binder is ground down together with iron oxide material at a high energy input to produce a fine grain additive material. The additive material is then mixed with the mineral concentrates and agglomerates are formed from the mixture and steam hardened.

3,825,639

METHOD OF ENCAPSULATING ELECTRIC EQUIPMENT

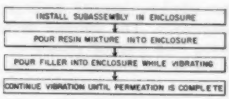
Edward G. Bulin, Reedsburgh, Wis., assignor to Webster Electric Company, Inc., Racine, Wis.

Continuation-in-part of application Ser. No. 223,178, Feb. 3, 1972. This application Aug. 30, 1972, Ser. No. 284,772

The portion of the term of the patent subsequent to Mar. 5, 1991, has been disclaimed

Int. Cl. B29c *6/02*

U.S. Cl. 264—72 6 Claims


INSTALL SUBASSEMBLY IN ENCLOSURE
POUR RESIN MIXTURE INTO ENCLOSURE
POUR FILLER INTO ENCLOSURE WHILE VIBRATING
CONTINUE VIBRATION UNTIL PERMEATION IS COMPLETE

A method of encapsulating electrical equipment comprises the steps of (a) placing the electrical equipment into an enclosure or casing, (b) pouring a resin-catalyst mixture into the enclosure, (c) pouring a filler into the enclosure while vibrating the enclosure at a frequency that is continually maintained at substantially the resonant frequency of the enclosure, the equipment, the resin-catalyst mixture and the portion of the filler added to the enclosure, and (d) continuing the vibration of the enclosure at the resonant frequency of the enclosure, the equipment, the resin-catalyst mixture and the filler until the resin-catalyst mixture has substantially permeated the filler.

3,825,640
PROCESS FOR MANUFACTURING A POROUS, SOLID, ARTICLE

Theodore Maierson, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

No Drawing. Filed Apr. 27, 1972, Ser. No. 248,157
Int. Cl. B29c *1/14*
U.S. Cl. 264—87 **2 Claims**

A process for manufacturing an article is disclosed wherein the article includes the features of a solid and a liquid and is also porous and, therefore, relatively lightweight. The article comprises a mass of substantially spherical, liquid-containing, microcapsules adhered together at capsule-to-capsule points of contact by dot amounts of cured adhesive material such that intercapsule voids are maintained to provide porosity. One embodiment of the process includes steps of filling a mold with the microcapsules and introducing and withdrawing a liquid, curable, adhesive material to leave only a residual amount of the curable adhesive material at capsule-to-capsule points of contact.

3,825,641
METHOD OF FORMING MULTIPLE PASSAGEWAY PLASTIC CONDUIT

Louis H. Barnett, 3631 Encanto Drive, Fort Worth, Tex. 76109

Original application June 4, 1971, Ser. No. 149,910, now abandoned. Divided and this application July 20, 1972, Ser. No. 273,359
Int. Cl. B29c *17/07, 25/00;* B29d *23/04*
U.S. Cl. 264—89 **6 Claims**

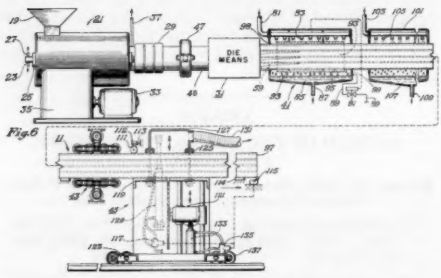


Fig. 6

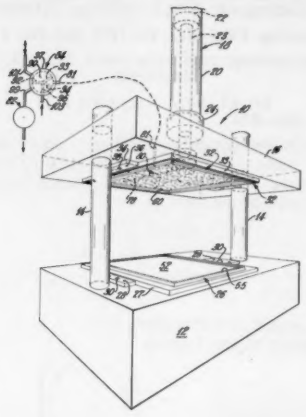
Method for forming conduit having a plurality of longitudinally extending passageways disposed adjacent each other within an exterior wall, the passageways having at least a portion of their interior walls in common with adjacent passageways. The conduit is continuously extruded and sized in a vacuum chamber. Cooling stinger means extending from the die are used to support the conduit until cooled to a non-pliable state. Cooling fluid may be applied interiorly along the passageways so as to effect vertically decreasing pressures within the passageways for further supporting the interior walls thereabout.

3,825,642
METHOD FOR PRODUCING A FILM-FACED PRODUCT

Jared R. Kies, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation

Filed Nov. 3, 1971, Ser. No. 195,246
Int. Cl. B29c *17/04;* B29j *5/04*
U.S. Cl. 264—90 **8 Claims**

Method of molding a film-faced product. The method involves placing a body or mass of compressible material such as a body or mass of mineral fibers impregnated with a binder in a contoured molding matrix with a self-supporting resinous film disposed on a major surface of the body or mass, applying reduced pressure to force the film into intimate contiguous engagement with a contoured matrix, compressing the body



or mass of material in the molding facility, and setting the binder in the molded product. The film facing of the product is adhered to the compressed mass or body and shaped to a high fidelity of configuration of the molding matrix.

3,825,643
PRODUCTION OF SHAPED ARTICLES

Edward Francis Herbert Benjamin Hillier, Cheltenham, and Anthony Roger Holmes, Haslemere, England, assignors to Dowty Seals Limited, Tewkesbury, Gloucestershire, England

Filed Apr. 30, 1971, Ser. No. 138,872
Claims priority, application Great Britain, May 20, 1970, 24,317/70
Int. Cl. B29b *7/00;* B29d *7/02*
U.S. Cl. 264—161 **4 Claims**

A method for the production of a shaped article using an open mould in which an article-shaping cavity in the mould is filled with a pasty material includes distributing pasty material, over a part at least of the surface of the mould adjacent to and from which the cavity extends, by pressing a foraminous material against the said part of the surface and then removing the foraminous material, enabling the pasty material on the surface to flow to form a thin layer which is joined to the material in the cavity and which has a sufficient strength after setting to allow the article to be pulled from the cavity by pulling the layer, setting the pasty material, and removing the article from the cavity by pulling the layer of material on the surface, to which the article is attached, away from the surface.

3,825,644

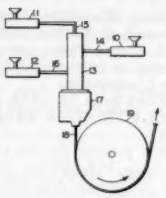
PROCESS FOR PRODUCING MULTILAMINATE FILM

John M. Hoagland, Pleasant Hill, George M. Tokos, Dublin, and Edward G. Tonn, Oakland, Calif., assignors to Crown Zellerbach Corporation, San Francisco, Calif.

Continuation of application Ser. No. 862,126, Aug. 11, 1969, which is a division of application Ser. No. 492,212, Oct. 1, 1965, both now abandoned. This application Jan. 27, 1972, Ser. No. 221,405

Int. Cl. B29f *3/10;* B32b *31/00*

U.S. Cl. 264—171 4 Claims



A process for producing multilaminate film by forming a composite resin plug, laterally expanding the composite resin plug widthwise so as to produce a laterally expanded molten plastic resin stream substantially equal in width to that of a multilaminate thermoplastic film which is to be extruded through a long, narrow orifice of a die, and laminarly flowing the expanded molten plastic resin laminate to the long, narrow orifice and meanwhile compressionally convergently reducing the laterally expanded plastic resin stream in thickness to the long, narrow orifice, and extruding the thermoplastic film through the long, narrow orifice.

3,825,645

EXTRUSION METHOD AND APPARATUS

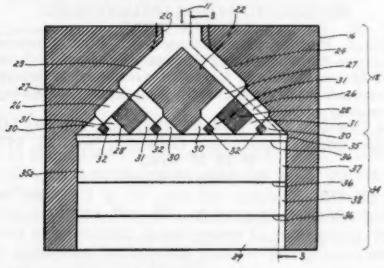
Andre Barthelemy Marie Fayet, Puy de Dome, France, assignor to Tri-Cology, Inc., Manhasset, N.Y.

Filed May 10, 1972, Ser. No. 251,972

Claims priority, application France, May 10, 1971, 7116828

Int. Cl. B29f *3/00*

U.S. Cl. 264—177 10 Claims



A method and apparatus for extruding thermoplastic material containing a substantial quantity of an inert substance. The material is directed through a multiplicity of diagonal channels in an extrusion head in accordance with a triangular distribution such that each particle of material travels a uniform distance in a uniform length of time. The forces acting on each particle at a given distance along its flow path are the same, and the material is subjected to compression as it moves through the head with the result that there is provided an extremely even distribution of the inert substance within the finished product.

3,825,646

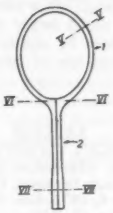
PROCESS FOR THE MANUFACTURING OF RACKETS FOR TENNIS AND OTHER SIMILAR GAMES

Roger Edmond Delmotte, Mourcourt, Belgium, assignor to Societe Anonyme les Usines de Callenelle en Abrege Saluc, Callenelle, Belgium

Filed Apr. 14, 1972, Ser. No. 244,043

Int. Cl. B29c *1/08;* B29d *9/00*

U.S. Cl. 264—257 2 Claims



On a core which is stretched in a straight line and has a length corresponding to the periphery of a racket, including the parts of the handle, reinforcing tapes are wound where necessary a fibre material parallel to the core. The core is bent so as to impart to it the form of a racket blank. The materials applied onto the core are impregnated with pre-polymerized synthetic material, either before or after the bending. The blank is placed in a mould so as to give the racket the final shape and to bring about the final polymerization of the pre-polymerized material.

3,825,647

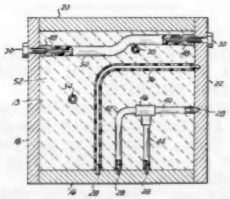
METHOD OF MAKING BLOCK MANIFOLD FOR FLUID CONTROL SYSTEMS

Jerry Kirsch, 36 Beacon Hill, Grosse Pointe Farms, Mich. 48236

Original application Nov. 19, 1970, Ser. No. 91,077, now Patent No. 3,683,960. Divided and this application Oct. 28, 1971, Ser. No. 193,707

Int. Cl. B29d *3/00*

U.S. Cl. 264—277 2 Claims



A mold is prepared with separable side and top walls having plugs, pipe couplings or barbed tube connectors seated in the walls thereof. The ends of tubes, preferably

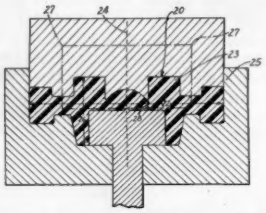
of flexible plastic material, are slipped over the ends of these plugs, pipe couplings or barbed tube connectors within the mold cavity. A protective coating or "release coating" is placed on the inner surface of the mold to prevent adhesion of plastic to the mold walls, whereupon synthetic plastic, preferably transparent, in a fluid state is poured into the mold cavity—preferably the two epoxy resin fluids which, when combined and allowed to set produce a solid transparent epoxy resin body. The synthetic plastic material in which the tubes are thus embedded is permitted to solidify, after which the walls of the mold are withdrawn, leaving the preferably transparent synthetic plastic block with the ends of the tubes or the couplings attached thereto exposed at the sides of the block. T couplings connected to such tubes may optionally be embedded in the plastic body. The various conduits of a fluid system as well as valves may then be connected to the tubes or mounted on and secured to the block in communication with the ports provided by the exposed open ends of certain of the tubes, thereby compressing into a very small space tube circuits which would otherwise occupy a much larger space. Changes in the circuit are easily made by shifting the external circuit tubes between different sets of connections, couplings or ports.

3,825,648

FORGING OF RIGID CRYSTALLINE PLASTICS

Kishor M. Kulkarni, Clarendon Hills, Ill., assignor to ITT Research Institute, Chicago, Ill.

Filed July 6, 1972, Ser. No. 269,383
Int. Cl. B29c *1/14*
U.S. Cl. 264—322 **4 Claims**



A method for defect-free forging of rigid crystalline plastics such as acetal plastics, in which a workpiece blank of preselected volume and temperature is placed between the dies of a die cavity at a preselected temperature, the dies are positioned to contact the blank and subsequently closed at a speed between 0.5 and 10 inches per minute, the die cavity is opened, and the forged article is removed.

3,825,649

PROCESS FOR SEPARATION OF PROTACTINIUM, THORIUM AND URANIUM FROM NEUTRON-IRRADIATED THORIUM

Alan T. Gresky, Jouko E. Savolainen, and William T. McDuffee, Jr., Oak Ridge, and Russell P. Wischow, Nashville, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Aug. 7, 1956, Ser. No. 602,686
Int. Cl. C01g *56/00*; C22b *61/04*
U.S. Cl. 423—4 **21 Claims**

Protactinium, uranium and thorium are separated from an aqueous nitric acid solution of neutron-irradiated thorium containing these elements and fission products by contacting, under net nitrate deficient conditions, the acid solution with an organic solution of a trialkyl phosphate in an inert organic diluent, thereby preferentially extracting uranium and thorium into the organic phase while confining protactinium and fission products to the aqueous phase. After scrubbing the organic phase with a aqueous solution of an inorganic nitrate salt to remove small amounts of protactinium and fission products, the two phases are separated and thorium and uranium are separately recovered from the organic phase.

3,825,650

DECONTAMINATING URANIUM BY REACTION WITH ClF_3 AND HF AND VOLATIZING THE UF_6 PRODUCT

Robert A. Gustison, Knoxville, Harvey A. Bernhardt, Oak Ridge, Eugene J. Barber, Kingston, and Samuel T. Benton, Oak Ridge, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed June 18, 1954, Ser. No. 437,903
Int. Cl. C22b *61/04*; C01g *43/06*
U.S. Cl. 423—19 **6 Claims**

1. A fluorination process for the recovery and decontamination of uranium values from extraneous impurities which comprises dissolving said uranium in a reaction zone with a liquid fluorination solution comprising chlorine trifluoride and hydrogen fluoride maintained at a ClF_3-HF mole ratio of approximately 0.1–2.0 and at least approximately 0.1 mole UF_6 mole HF in excess of the HF requirements of the $HF \cdot 2ClF_3$ azeotrope, fractionally distilling the resulting reaction mixture and separately recovering the resulting UF_6 product and the fraction of said reaction mixture relatively lower boiling than said UF_6 and returning said low boiling fraction to said reaction zone for the further dissolution of uranium.

3,825,651

RECOVERY OF GOLD FROM ORES

Harold J. Heinen, Reno, and Judith A. Eisele, Verdi, Nev., and Dennis D. Fischer, Mitchell, S. Dak., assignors to the United States of America as represented by the Secretary of the Interior

No Drawing. Filed Oct. 14, 1971, Ser. No. 189,198
Int. Cl. C01g *7/00*; C22b *11/06*
U.S. Cl. 423—44 **9 Claims**

Gold is recovered from its ores by treating the ores at elevated temperature with gaseous chlorine in the presence of metallic iron, a sulfide of iron, aluminum sulfide or gallium sulfide to form a volatile complex of the formula $AuMeCl_6$, where Me is iron, aluminum or gallium.

3,825,652

PRODUCTION OF MANGANESE (II) SALT SOLUTIONS

Eberhard Preisler, Hurth-Knapsack, Kurt Grapentin, Cologne-Zollstock, Ernst Harmsen, Erftstadt-Lechenich, and Heinz Harnisch, Lovenich, Germany, assignors to Knapsack Aktiengesellschaft, Knapsack, near Cologne, Germany

No Drawing. Filed Nov. 23, 1971, Ser. No. 201,318
Claims priority, application Germany, Nov. 25, 1970, P 20 57 939.9
Int. Cl. C01g *45/00, 45/10*
U.S. Cl. 423—50 **8 Claims**

Production of manganese (II) salt solutions having minor proportions of heavy metal contaminants therein by introducing one or more commercial manganese (II) compounds or ores into a mineral acid solution, precipitating the heavy metals by means of a sulfide compound, and isolating the resulting precipitate. More particularly, the commercial manganese (II) compounds or ores are introduced into the mineral acid solution and, while omitting filtration, the heavy metal sulfides are precipi-

tated at a pH-value of between 3.5 and 8.2 and the precipitated sulfides are isolated together with the vein ore of the commercial manganese (II) compounds or ores, in a single step operation.

3,825,653

PROCESS FOR PREPARING SINTERABLE ALUMINUM TITANATE POWDER

Walter K. Duerksen, Norris, and Cressie E. Holcombe, Jr., and Margaret K. Morrow, Oak Ridge, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Sept. 11, 1972, Ser. No. 288,228
Int. Cl. C01g *23/00*
U.S. Cl. 423—598 3 Claims

Sinterable aluminum titanate powder is prepared by coprecipitating halide or alkoxide compounds of aluminum and titanium as a hydroxide. The resulting hydrated aluminum titanium hydroxide is dried and then calcined in air to form the powder. Slip casting or isostatic pressing techniques together with sintering may be employed to prepare products of aluminum titanate.

3,825,654

PROCESS FOR REDUCING THE CONTENT OF NITROGEN OXIDES IN THE EXHAUST GASES FROM INTERNAL COMBUSTION ENGINES

Tadeusz P. Kobylinski, Cheswick, and Brian W. Taylor, Richland Township, Allegheny County, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed Apr. 21, 1972, Ser. No. 246,170
Int. Cl. B01d *53/34*
U.S. Cl. 423—213.7 20 Claims

A method is proposed for the reduction of nitrogen oxides in exhaust gases from internal combustion engines to form nitrogen as substantially the only nitrogen-containing compound. The method comprises contacting an exhaust gas from an internal combustion engine at an elevated temperature in a first zone in a reducing atmosphere with a catalyst, such as platinum, that will convert the nitrogen oxides to a product comprising ammonia and thereafter contacting the resultant gaseous mixture at an elevated temperature in a second zone in a reducing atmosphere with ruthenium or rhodium to convert the ammonia to nitrogen.

3,825,655

PRODUCTION OF HYDROGEN FLUORIDE AND METAL SULFATES

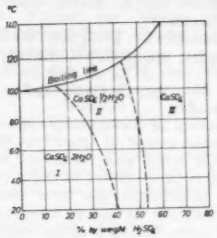
Eduard Eipeltauer, Ma-Enzersdorf-Suedstadt, and Hans-Dietrich Lauss, Thenning, Austria, and Bernhard Spreckelmeyer, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 14, 1972, Ser. No. 271,895
Claims priority, application Germany, July 29, 1971, P 21 38 015.4
Int. Cl. C01b *7/22;* C01f *11/46*
U.S. Cl. 423—485 13 Claims

In the production of hydrogen fluoride and a metal sulfate by the reaction of a metal fluoride with sulfuric acid in an aqueous suspension at an elevated temperature up to about 350° C., the improvement which comprises

(a) in a first stage contacting the metal fluoride with about 1.2 to 11 times the stoichiometric amount of about 20 to 100% sulfuric acid at an elevated temperature up to about 300° C., and separating hydrogen fluoride formed, and

(b) passing the reaction mass to a second stage, separating the liquid phase in said second stage, and recycling the liquid to said first stage. Advantageously the reaction is completed in a third stage at 50 to 350° C. carried out on the solid residue from the second stage, liquid from the second stage being recycled to the first stage. To supply some of the heat of reaction, the sulfuric acid may be formed in situ from sulfur trioxide and/or oxides or hydroxides of alkali or alkaline earth metals may be added. Such additives, or others such as potassium or iron sulfate,



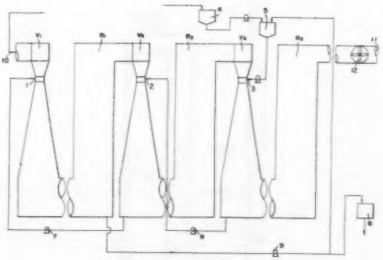
will also affect the grain size and shape of the metal sulfate produced by the primary reaction. When the metal fluoride is calcium fluoride, the extent of hydration of the calcium sulfate product can be predetermined by following the reaction conditions set out in FIG. 1.

3,825,656

PROCESS FOR PREPARING HEXAGONAL SYSTEM PRISMATIC CALCIUM SULFITE

Keiichi Murakami, Sendai, Hiroshi Hoshi, Narashino, Michio Hirakawa, Ichikawa, and Rinnosuke Susuki, Tokyo, Japan, assignors to Lion Fat and Oil Company, Ltd., Tokyo, Japan

Filed Dec. 16, 1971, Ser. No. 208,602
Claims priority, application Japan, Dec. 26, 1970, 45/129,628
Int. Cl. C01f *11/48*
U.S. Cl. 423—512 8 Claims



Hexagonal system prismatic calcium sulfite, which is useful as a filler for thermoplastic resins, is prepared by contacting an SO_2-containing gas with a suspension of calcium hydroxide, precipitated calcium carbonate, or mixtures thereof wherein the SO_2-containing gas is passed continuously through a plurality of contact zones in which the first of said zones has a temperature of 50°–100° C. and a pH of 3–6 and each succeeding contact zone has a temperature of 50°–100° C. and a pH of higher than 6,

while simultaneously passing the suspension through said plurality of contact zones counter-currently to the direction of the flow of the SO_2-containing gas.

3,825,657
PROCESS FOR THE CRACKING OF SULFURIC ACID

Ernst Jenniges, Cologne-Hohenberg, Germany, assignor to Chemiebau Dr. A. Zieren GmbH & Co., K.G., Cologne, Germany

Filed July 29, 1971, Ser. No. 167,231
Claims priority, application Germany, July 29, 1970, P 20 37 619.6
Int. Cl. C01b *17/58*
U.S. Cl. 423—540 **9 Claims**

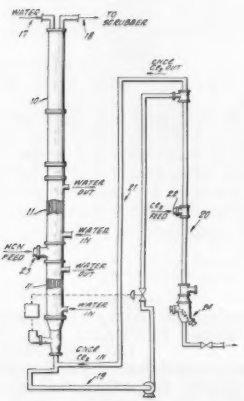
In the cracking of waste sulfuric acid to produce SO_2-containing gases devoid of impurities deleterious to SO_3 conversion, the waste acid containing about 30–60% by weight H_2SO_4 is concentrated to about 60–75% by weight H_2SO_4 prior to cracking, the latter step being improved from the standpoint of energy consumption by passing the cracking gases having a temperature of about 1000° C. in direct contact with the 30–60% by weight acid to evaporate water therefrom.

The cracking gases are then cooled to condense out water and impurities. Organic impurities are scrubbed out of the resultant gas with H_2SO_4, the latter, when loaded with impurities being passed to the cracking stage. Residual SO_2 contained in the condensed out water is entrained by an air stream, and the resultant SO_2 plus air is used as combustion air in the cracking stage.

3,825,658
PROCESS FOR THE PREPARATION OF CYANOGEN CHLORIDE

Robert John Eckert, Jr., and Roy Joseph Laran, Mobile, Ala., assignors to Ciba-Geigy Corporation, Greenburgh, N.Y.

Continuation-in-part of abandoned application Ser. No. 862,214, Sept. 30, 1969. This application Jan. 5, 1972, Ser. No. 215,645
Int. Cl. C01b *21/18*
U.S. Cl. 423—383 **2 Claims**



An improved process is provided in the manufacture of cyanogen chloride involving the reaction of hydrogen cyanide and chlorine wherein the removal of cyanogen chloride is effected in the presence of about 1 to 3% hydrogen cyanide and at least 14% hydrogen chloride. This level of hydrogen cyanide minimizes or eliminates the formation of the undesirable nitrogen trichloride by-product.

3,825,659
METHOD OF PREPARING SODIUM-ALUMINUM FLUORIDE

Maurice Clark Harrison and Donald Otis Vancil, Longview, Wash., assignors to Reynolds Metals Company, Richmond, Va.

No Drawing. Application June 7, 1972, Ser. No. 260,588, now Patent No. 3,755,532, which is a division of application Ser. No. 62,129, Aug. 7, 1970, now Patent No. 3,704,092. Divided and this application Jan. 17, 1972, Ser. No. 324,384
Int. Cl. C08f *7/00, 7/54*
U.S. Cl. 423—465 **1 Claim**

A sodium fluoride-aluminum fluoride double salt is prepared by admixing a solution of NaF having a pH between about 7.0 and about 7.5, and a solution of AlF_3 having a pH between about 2.7 and about 3.0, so that the resulting reaction goes to completion at a pH between about 3.0 and about 6.8, at a temperature between about 145° F. and about 185° F.

3,825,660
ANTIBIOTIC NO. 156 AND PROCESS FOR PRODUCING THE SAME

Isao Takeda, Tokyo, Masayuki Mizuno, Saitama, Toshiaki Sugawara and Yukiji Shimojima, Tokyo, and Sadayuki Horiguchi, Kanagawa, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 6, 1971, Ser. No. 186,976
Claims priority, application Japan, Nov. 5, 1970, 45/96,847, 45/96,848
Int. Cl. A61k *21/00*
U.S. Cl. 424—119 **7 Claims**

An antibiotic named as antibiotic No. 156 which having an elementary analysis of C, 55.07%, H, 7.82%, N, 6.33% and O, 29.92%, an optical rotation of $(\alpha)_D^{18}$ of +4.3° in aqueous n-butanol, a melting point of 210° C. or more, a molecular weight of 890, and the infrared and ultra-violet absorption spectra shown in the accompanying FIGS. 1 and 2, respectively.

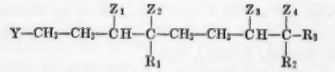
This antibiotic is useful for controlling rice blast disease, and is prepared by aerobically culturing *Streptomyces 156* (NRRL 5319) in a liquid medium containing a carbon source, a nitrogen source and inorganic salts, and may be isolated from both mycelium and culture filtrate.

3,825,661
INSECT CONTROL EMPLOYING COMPOUNDS HAVING JUVENILE HORMONE-LIKE ACTIVITY

Thomas L. Emmick, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Continuation-in-part of application Ser. No. 877,019, Nov. 14, 1969, which is a continuation-in-part of application Ser. No. 787,281, Dec. 26, 1968, both now abandoned. This application Oct. 8, 1971, Ser. No. 187,890
Int. Cl. A01n *9/28*
U.S. Cl. 424—278 **6 Claims**

Insect populations are controlled by treating an immature form of the insect with a compound possessing juvenile hormone-like activity. Such a compound is one having the formula



wherein Y is thienyl, phenyl or substituted phenyl. For example, 9-(3,4-methylenedioxyphenyl)-2,6-dimethyl-2,6-nonadiene exhibits very good activity. Many of the compounds described are novel.

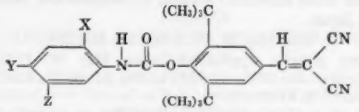
3,825,662

METHOD FOR COMBATING CERTAIN FOLIAR DISEASES OF PLANTS

Roger Paul Cahoy, Overland Park, Kans., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed Oct. 18, 1971, Ser. No. 190,395
Int. Cl. A01n *9/20*
U.S. Cl. 424—300 **2 Claims**

Fungus and bacterial foliar diseases of plants are combated by applying to the plants an effective but substantially non-phytotoxic amount of a compound having the structural formula



in which X is selected from the group consisting of hydrogen and chloro and nitro substituents,

Y is selected from the group consisting of hydrogen and chloro and fluoro substituents, and

Z is selected from the group consisting of hydrogen and chloro substituents, at least one of X, Y and Z being hydrogen.

3,825,663

METHOD OF COMBATING INSECT PESTS WITH PHENYLCARBAMYLOXYDI*TERT*·BUTYLBENZYLIDENEMALONONITRILES

John Sanjean, Leawood, and Roger P. Cahoy, Overland Park, Kans., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Continuation-in-part of application Ser. No. 70,529, Sept. 8, 1970, now Patent No. 3,694,483. This application Mar. 20, 1972, Ser. No. 236,341
Int. Cl. A01n *9/20*
U.S. Cl. 424—300 **7 Claims**

N-benzoylcarbamyloxy-, chlorophenylcarbamyloxy- and bromophenylcarbamyloxy - 3,5 - di*tert*.butylbenzylidenemalononitriles are useful in combating a variety of agricultural mites and insect pests, including tobacco budworm, Southern army worm, fall army worm, 2-spotted mite and European corn borer. Particularly useful against tobacco budworm are the 4 - bromo - 3 - chlorophenylcarbamyloxy- and the 2,4 - dichlorophenylcarbamyloxy compounds. For control of European corn borer the N-benzoylcarbamyloxy-, 4 - bromo - 3 - chlorophenylcarbamyloxy- and the 2,4-dichlorophenylcarbamyloxy- compounds are particularly useful. For control of fall army worm the N-benzoylcarbamyloxy- compound is preferred.

3,825,664

METHOD FOR TREATING BACTERIAL TOXINS

Guy Hagemann, Nogent sur Marne, and Francois Clemence, Rosny-sous-Bois, France, assignors to Roussel-UCLAF, Paris, France

No Drawing. Filed Jan. 6, 1971, Ser. No. 104,516
Claims priority, application France, Jan. 13, 1970, 7001040
Int. Cl. A61k *27/00*
U.S. Cl. 424—316 **5 Claims**

Compositions for treating microbic infections having as the active ingredient racemic or optically active isomers of N-succinyl-glutamic acid and its non-toxic, pharmaceutically acceptable salts with mineral or organic bases and a method of combatting infections in warm-blooded animals.

3,825,665

BENZENESULFONYL UREAS AND THEIR USE IN TREATING DIABETES

Helmut Weber, Frankfurt am Main, Walter Aumüller, Kelkheim, Taunus, Rudi Weyer, Frankfurt am Main, Karl Muth, Kelkheim, Taunus, and Felix Helmut Schmidt, Mannheim-Neuostheim, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Original application Nov. 7, 1967, Ser. No. 681,116, now abandoned. Divided and this application Jan. 29, 1971, Ser. No. 111,090
Claims priority, application Germany, Nov. 29, 1966, F 50,793
Int. Cl. A61k *27/00*
U.S. Cl. 424—322 **8 Claims**

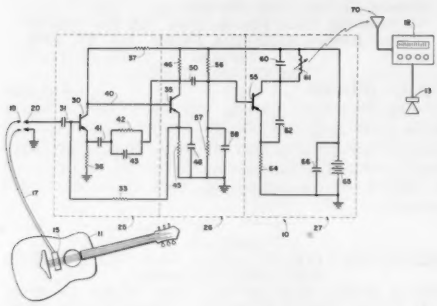
N-[4 - (β - benzamido-ethyl) - benzenesulfonyl] - N'-(endoalkylenecyclohexyl- or cyclohexenyl)-ureas being substituted at the benzamido group and having hypoglycemic activity and useful for preparing pharmaceutical compositions and used in a method for lowering blood sugar level in the treatment of diabetes mellitus.

3,825,666

APPARATUS FOR TRANSMITTING THE OUTPUT OF A MUSICAL INSTRUMENT FOR AMPLIFICATION

H. Dane Jaggers, Ozark, Ark., assignor to Lectrasearch Corporation, Tulsa, Okla.

Filed July 30, 1973, Ser. No. 383,529
Int. Cl. G10h *1/00*
U.S. Cl. 84—1.01 1 Claim



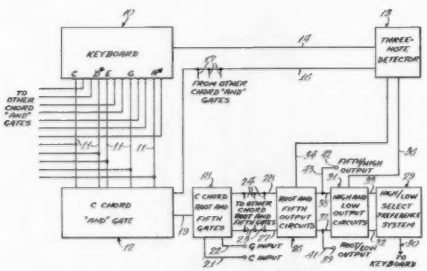
Apparatus for generating a signal from an electrical instrument includes two transistor amplifiers adapted to receive electrical signals from a transducer in the vicinity of the vibrations from the instrument. The amplified signal is applied to an oscillator which includes a radiating element to frequency modulate the oscillator signal with the amplified signal. The oscillator signal is radiated, detected, amplified, and reproduced by a nearby fm radio.

3,825,667

ALTERNATE HIGH-LOW AND ROOT-FIFTH SELECTION SYSTEM FOR ELECTRICAL MUSICAL INSTRUMENTS

Ray B. Schrecongost, Park Ridge, Ill., assignor to Hammond Corporation, Deerfield, Ill.

Filed Feb. 15, 1973, Ser. No. 332,642
Int. Cl. G10h *1/00*
U.S. Cl. 84—1.01 10 Claims



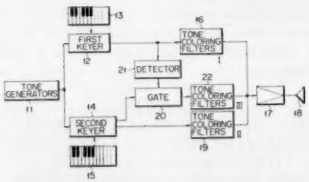
A note selection system for a keyboard type electrical musical instrument which supplies to output leads the note signals corresponding to the highest and lowest notes of a group of notes played, or, in the alternative, the note signals corresponding to the musical root and fifth notes of certain three-note chords whenever only the three notes comprising each of these particular chords are played. The disclosed embodiment responds to playing any of four three-note chords in each of the 12 musical keys to supply the corresponding root and fifth note signals of these chords; if any other three-note chords, or other than three notes are played, the system supplies the highest and lowest note signals of the group of notes played.

3,825,668

ELECTRONIC MUSICAL INSTRUMENT CAPABLE OF PROVIDING A THIRD TYPE OF MUSICAL TONES BY OPERATION OF TWO KEYBOARDS IN ADDITION TO THE ORDINARY MELODY AND CHORD TONES

Shimaji Okamoto, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan

Filed May 29, 1973, Ser. No. 364,257
Claims priority, application Japan, May 30, 1972, 47-53551; May 30, 1972, 47-53552; May 30, 1972, 47-53553; May 30, 1972, 47-53554
Int. Cl. G10h *1/02*
U.S. Cl. 84—1.17 16 Claims



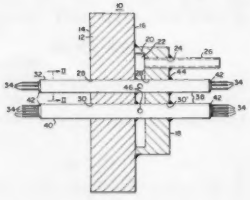
In an electronic musical instrument equipped with a first keyboard for melody performance and a second keyboard for chord performance, operation of the first keyboard is detected directly or indirectly by a detector to produce a control or detection signal. Tone signals derived from the tone generators by operation of the second keyboard are branched to a gate which is enabled by the control signal so as to cause operation of both first and second keyboards to attain the production of a third type of musical tones in addition to the ordinary melody and chord tones. Output tone signals from the gate may be supplied with a sustaining or percussive envelope and modulated in amplitude or frequency.

3,825,669

HIGH TEMPERATURE, HIGH PRESSURE ELECTRICAL PENETRATION ASSEMBLY

Renzo L. Korner, Horseheads; Ralph J. White, Montour Falls; Robert A. Shaffer, and George R. Turner, both of Elmira, all of N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 29, 1973, Ser. No. 364,452
Int. Cl. H01b *17/26*; G21c *13/02*
U.S. Cl. 174—11 R 8 Claims



An electrical penetration assembly for high temperature, high pressure applications, such as for bringing electrical con-

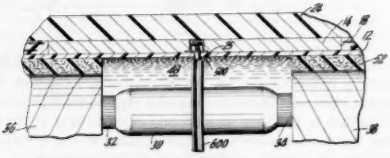
ductors through a nuclear reactor primary vessel or containment vessel. The electrical conductors are disposed within refractory oxide which has a gas impervious outer sheath thereabout. A seal is provided between the electrical conductors and the outer sheath at spaced positions. The sheathed conductor is passed through aligned apertures in headers which permit easy connection and sealing of the assembly to an exit port of the vessel. The outer sheaths are sealed to each header. The headers are spaced apart to provide a chamber therebetween, and an aperture is provided through the sheath within the chamber to permit leak detection.

3,825,670

CONNECTOR FOR USE IN CAPACITIVE GRADED SPLICES

Carlos Katz, Spring Valley; Felipe Garcia, and Elsayed Allam, both of New City, all of N.Y., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Nov. 7, 1973, Ser. No. 413,706
Int. Cl. H02g *15/08*
U.S. Cl. 174—73 R **4 Claims**



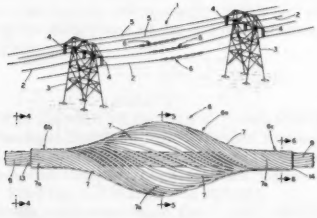
Electrostatic connector means, for joining the central conductor connector in a cable splice with an equipotential ring surrounding a non-conducting supporting sleeve, including an annular conductive member attached to the conductor connector and spring biased plungers connected to the ring and extending inwardly through apertures in the sleeve into contact with the annular conductive member.

3,825,671

TRANSMISSION LINE AUDIBLE NOISE AND CORONA REDUCING DEVICE

William C. Pokorny, 522 Pershing Ave. S.E., North Canton, Ohio 44720

Filed Aug. 6, 1973, Ser. No. 386,216
Int. Cl. H02g *7/00*
U.S. Cl. 174—40 R **8 Claims**



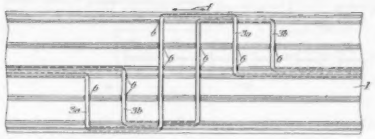
A device for attachment to EHV and UHV transmission line conductors to reduce audible noise and other corona effects. A plurality of metallic rods each having a preformed shape are mounted on a conductor and form one or more cage-like generally elliptical structures. Each rod end portion has a helical shape, and the end portions of a complement of said rods form a cylindrical configuration having an inner diameter generally equal to the outer diameter of the conductor. The rod end portions have sufficient resiliency to wrap about and grip the conductor, eliminating the need of clamps, etc. to retain the elliptical cages thereon. The cages effectively increase the conductor diameter, modify the electrical field pattern about the conductor, and reduce the surface gradient to reduce audible noise and other corona effects.

3,825,672

DEVICE EMITTING OR RECEIVING ELECTRICAL SIGNALS RESULTING FROM THE MOVEMENT OF A VEHICLE ALONG THE DEVICE

Jean-Pierre Malon, 32, Domaine de Chateau-Gaillard, 94-Maisons Alfort, and Joseph Andre Loreau, 49, rue ARCEL Bourbarias, 94-Alfortville,, France

Filed May 13, 1971, Ser. No. 143,164
Claims priority, application France, May 13, 1970, 70.17502
Int. Cl. B61l *1/02*
U.S. Cl. 174—97 **6 Claims**



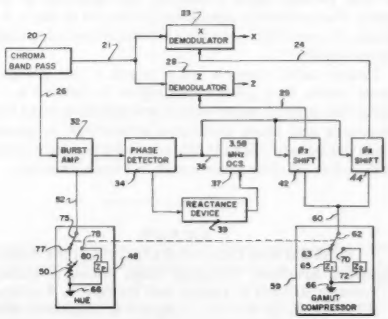
The device includes cables along the path of a vehicle to transmit signals to this vehicle or receive them by induction. These cables are fixed on a band of flexible and elastic material. The cables can thus be fixed to the band in the factory and the positioning of the band with its cables in place can be effected by unwinding from a spool and fixing the band on a support by means of clamps. The device is particularly useful for automatic piloting of metropolitan trains.

3,825,673

COLOR GAMUT COMPRESSOR

John H. Furrey, Schaumburg, and George C. Le Crenn, Palatine, all of Ill., assignors to Warwick Electronics Inc., Chicago, Ill.

Filed Mar. 4, 1971, Ser. No. 120,962
Int. Cl. H04n *9/38*
U.S. Cl. 178—5.4 HE **13 Claims**



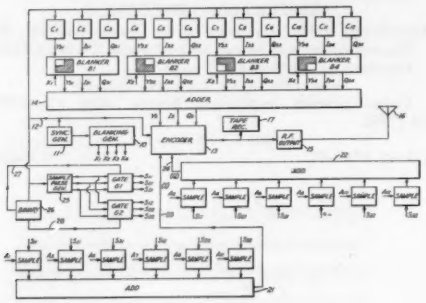
A gamut compressor circuit in the chroma channel of a color television receiver selectively changes the effective angle between the demodulation axes of a two axis demodulation system to visually minimize hue errors in the orange (flesh tone) and cyan regions. Apparatus is also provided to substitute a reference hue control when the gamut compressor circuit is in use.

3,825,674

EDUCATIONAL TV BRANCHING SYSTEM

James W. H. Justice, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 25, 1973, Ser. No. 364,164
Int. Cl. H04n *7/08*
U.S. Cl. 178—5.6 **19 Claims**



A closed circuit or conventional TV broadcast system features the transmitting and receiving of 12 separate pictures and including 12 audio channels on a single television carrier signal such that one of three different pictures appear in each quadrant of the television receiving tube, and including in the receiver, two detectors each preceded by band-pass filters for preventing cross-modulation of the video signals. The system further includes means for blanking out all but one quadrant and for centering and expanding that quadrant to occupy a full television raster.

Twelve TV cameras have their video output signals arranged in four groups of three signals. A blanker for each group blanks out all but one quadrant so that three video signals are provided for this quadrant. Blankers for the other groups of video signals operate in a similar manner with respect to the remaining three quadrants. By adding together one video signal from each group there results three composite signals. Each composite signal represents an assembly of four pictures each occupying one quadrant of the TV raster. The composite signals are connected to the Y, I and Q inputs of a modified encoder for transmission on a single TV carrier signal.

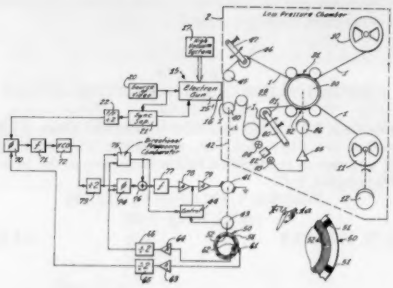
Twelve audio channels are arranged in two groups of six signal inputs. One group of six signals is inserted in a video signal line during a guard-band blank period as three bursts of amplitude and phase modulated subcarriers. A guard-band blank period is provided in the next video line for transmission of the other set of six audio signals in a similar manner.

3,825,675

SYSTEM FOR CONTROLLING FILM MOTION

Robert S. Bradford, Woodland Hills; Harvey J. Richardson, Ventura; Richard F. Dubbe, and Richard D. Ebbinga, both of Camarillo, all of Calif., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 19,614, March 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 829,666, June 2, 1969, abandoned. This application May 8, 1972, Ser. No. 251,219
Int. Cl. G11b *7/08, 15/54;* **H04n** *5/86*
U.S. Cl. 178—6.7 A **34 Claims**



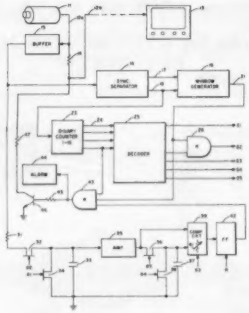
Photographic film is reeled and a loop thereof is included between the payout reel and the takeup reel. A capstan engages the film in the loop and controls movement of the film past a beam recorder in accordance with the sprocket holes in the film. The capstan is controlled to cause the beam to record equispaced lines and sequential video frames are particularly positioned relative to the sprocket holes in the film. In one embodiment of the invention the loop is isolated by a sprocket wheel and a sprocket capstan engages the film in the loop. The speed of the sprocket wheel is controlled so that loop branches between it and the capstan have constant length to thereby indirectly couple the wheel and the capstan. A high inertia idler near the recording area suppresses high frequency vibrations in the film. In a second embodiment of the invention the smooth capstan is used in place of the sprocket and capstan. In a third embodiment of the invention, a pair of compliance arms are used to control servoing of the payout and takeup reels and a smooth capstan engages the film in the loop.

3,825,676

SURVEILLANCE SYSTEM

Paul S. Ramsden, Jr., Hudson, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed July 7, 1972, Ser. No. 269,663
Int. Cl. H04n *7/18*
U.S. Cl. 178—6.8 **5 Claims**



A surveillance system using a closed circuit television installation is described in which a single integrating circuit is used to obtain two distinct measurements of the average value of the video signal pertaining to a preselected portion of the scene being viewed. The first measurement is made during one or more successive fields and this measurement is stored. The integrating circuit is then reset to zero and a second measurement made during a like number of subsequent fields. The measurement just made is then compared with the stored mea-

surement. Any difference in excess of a predetermined threshold is indicative of the motion of an object within the preselected portion of the scene. Continuous operation can be obtained by resetting the storage device, storing the most recent measurement, resetting the integrating circuit, making another measurement, comparing, etc.

3,825,677

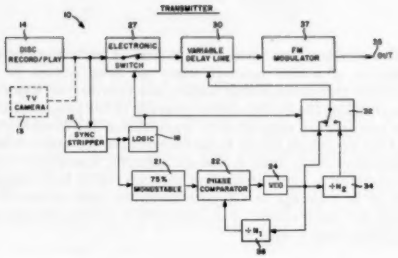
TELEVISION SCAN CONVERTER BANDWIDTH REDUCTION DEVICE

Vincent D. Kasprzak, Auburn, Calif., assignor to Arvin Industries, Inc., Columbus, Ind.

Continuation-in-part of Ser. No. 283,806, Aug. 25, 1972. This application Mar. 7, 1973, Ser. No. 338,667

Int. Cl. H04n *7/12*

U.S. Cl. 178—6.8 **8 Claims**



A television signal is transmitted over a narrow bandwidth transmission line or recorded over a narrow bandwidth recording device by scan converting the television signal a line at a time from a disc magnetic recorder. Each line of the video signal is loaded at high frequency into a variable delay line or storage element whose electrical length exactly equals a television line; the delay line is then switched to operate at a longer electrical length to convert the television line into a narrow bandwidth signal. Playback is accomplished by loading the low frequency signal into a variable delay line and then operating the delay line at the original, high frequency rate to unload the scan line into a disc magnetic recorder at the original high bandwidth. The video signal is reassembled a line at a time onto the receiver disc magnetic recorder for playing back the original video frame at the original high frequency and bandwidth.

3,825,678

PHOTOGRAPHIC IMAGE PICK-UP CODING SYSTEM

Hiroyoshi Tsuchiya; Yukifumi Tsuda; Heijiro Hayami, and Hiroaki Kotera, all of Osaka, Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

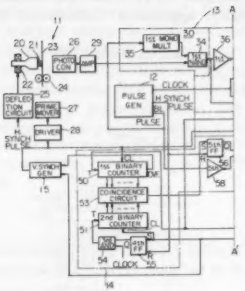
Filed Oct. 5, 1972, Ser. No. 295,555

Claims priority, application Japan, Oct. 7, 1971, 46-79203

Int. Cl. H04n *5/36, 7/12*

U.S. Cl. 178—7.1 **1 Claim**

A photographic image pick-up and coding system of run-length type, comprising a pulse generator for producing clock pulse, horizontal synchronizing pulse and horizontal pulse signals, a facsimile signal generator for repeatedly producing a facsimile signal representing photographic information on a horizontal line until energized by a coding completion signal, a run-length gate for passing therethrough the clock pulse signal during a time duration when a run-length gate pulse signal lasts, a run-length controller for producing the run-length gate signal by using the facsimile, clock pulse and blanking pulse signals, a coder for coding the clock pulse signal passed



through the run-length gate, and a modulator for modulating the coded clock pulse signal by a suitable carrier wave.

3,825,679

FILM SCANNER

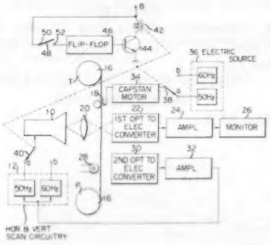
Greg Farrell, Sydney, New South Wales, Australia; Akira Tsuji; Dojun Hasimoto, both of Tokyo, Japan; Nobuhisa Koto, and Nobutake Hirai, both of Kyoto, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 5, 1973, Ser. No. 338,182

Claims priority, application Japan, May 8, 1972, 47-45676; Sept. 18, 1972, 47-108231

Int. Cl. H04n *5/36*

U.S. Cl. 178—7.2 **5 Claims**



The disclosed system includes a flying-spot scanner tube selectively operative with frame frequencies of 50 and 60 hertz, and a capstan for driving a record film at the synchronous speed of an associated synchronous motor selectively supplied with 50 and 60 hertz power. Only those record films having 50 frames recorded with video information per second are provided on the leader with an aluminum piece. Upon reproducing one of these films the aluminum piece contacts a guide roller which causes the system to switch to the 50 frame mode of operation. At the end of the rewinding of the reproduced film, the aluminum piece again contacts the guide roller to return the system to the normal mode of operation in which record films with 60 frames per second can be reproduced.

3,825,680
RECEIVER FOR VIDEO SIGNALS

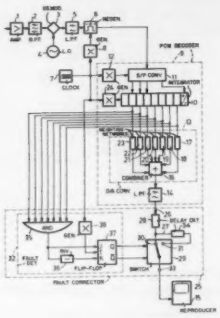
Leonardus Adrianus Johannes Verhoeven, Emmasingel, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 23, 1973, Ser. No. 326,040

Claims priority, application Netherlands, Feb. 3, 1972, 7201391

Int. Cl. H04n 1/38

U.S. Cl. 178—7.3 R **10 Claims**



A receiver for video signals which are transmitted, for example, by differential pulse code modulation and in which for the recovery of the analog video signal the demodulator is provided with an integrator whose time constant is many times the line period. The output of this integrator is coupled to a fault corrector provided with a fault detector, which fault corrector upon the command of the fault detector replaces a perturbed image line to be applied to the display arrangement by an unperturbed image line which has already been displayed or is still to be displayed.

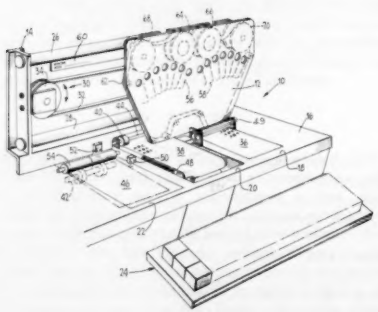
3,825,681
DATA TERMINAL WITH DUAL THREE-STATION PRINTING

Howard R. Cederberg, Alamo, and Charles W. Wiedeman, Castro Valley, both of Calif., assignors to The Singer Company, New York, N.Y.

Filed Jan. 5, 1973, Ser. No. 321,176

Int. Cl. H04l 21/00

U.S. Cl. 178—23 R **6 Claims**



A data terminal having a dual printing system for printing data in one, or two adjacent stations concurrently, of a three-station data terminal.

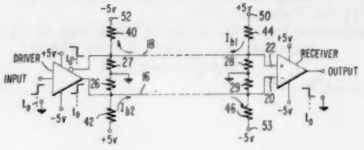
3,825,682
BALANCED LINE DRIVER, LINE RECEIVER SYSTEM

Paul Creighton Phillips, Medford Lakes, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed June 27, 1973, Ser. No. 374,139

Int. Cl. H04l 11/08

U.S. Cl. 178—69 G **6 Claims**



The problem dealt with here is that of preventing erratic behavior of a line receiver when an open occurs in the balanced transmission line feeding the receiver, or when the power supply for the line driver goes off. In the present circuit, bias currents are applied to the transmission line in such a way that the potentials due to these currents are the same on both conductors of the line. A resistor network, responsive to the interruption in bias current flow through one or both conductors or to a change in the path taken by such current flow, places the input circuit of the receiver at a voltage indicative of a given binary value.

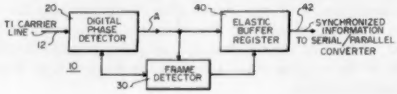
3,825,683
LINE VARIATION COMPENSATION SYSTEM FOR SYNCHRONIZED PCM DIGITAL SWITCHING

Satyan G. Pitroda, Villa Park, and Bernard J. Rekiere, Addison, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Nov. 10, 1972, Ser. No. 305,634

Int. Cl. H04l 7/00

U.S. Cl. 178—69.5 R **11 Claims**



A line synchronizer system including a digital phase detector subsystem, a frame detector subsystem and an elastic buffer register store subsystem is used within a digital PCM switching exchange to correct for timing or phase errors caused by cable temperature fluctuations and cumulative phase jitter. The line synchronizer system is utilized to correct for phase deviations of less than one bit position within the phase detector subsystem and provides for a predetermined number of bit position corrections within the elastic buffer register store subsystem. All timing corrections are bidirectional and are made during the framing bit which does not contain real information so hence that there is no loss of real information during a subsequent digital switching process. The line synchronizer system is described in connection with a frequency synchronized digital transmission loop using the master-slave synchronization method.

3,825,684
VARIABLE MATRIX DECODER FOR USE IN 4-2-4 MATRIX PLAYBACK SYSTEM

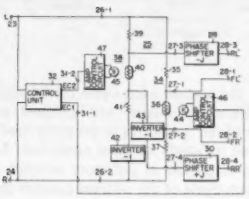
Ryosuke Ito, and Susumu Takahashi, both of Tokyo, Japan, assignors to Sansui Electric Co., Ltd., Tokyo, Japan

Filed Oct. 19, 1972, Ser. No. 298,933

Claims priority, application Japan, Oct. 25, 1971, 46-84484; Oct. 30, 1971, 46-86521; Nov. 4, 1971, 46-87832; Nov. 10, 1971, 46-89678; Dec. 29, 1971, 46-2145; Mar. 23, 1972, 47-29332; Apr. 17, 1972, 47-38407

Int. Cl. H04r *5/00*

U.S. Cl. 179—1 GQ **34 Claims**



A decoder for use in a four channel playback system includes a control unit and a variable matrix. The control unit produces first and second control outputs which vary in opposite directions in accordance with the phase relationship between two channel signals. The variable matrix includes a first variable matrix circuit for producing two outputs related to the front channels and having matrix coefficients controlled by the first control output from the control unit and a second variable matrix circuit for producing two outputs related to the rear channels and having matrix coefficients controlled by the second control output from the control unit. The control outputs are used to improve the separation between front channels and to degrade the separation between rear channels, and vice versa, thereby enhancing the sense of presence of listeners in a reproduced sound field. The present invention discloses another decoder which comprises a first control unit for front-rear control and a second control unit for left-right control whereby front-left and right channels and rear-left and right channels are independently controlled.

3,825,685
HELIUM ENVIRONMENT VOCODER

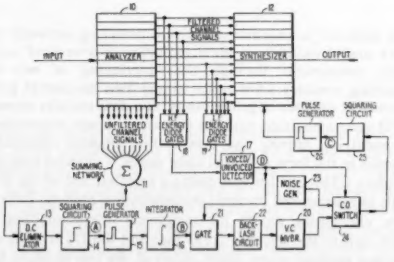
Donald Anthony Acott Roworth, Sawbridgeworth, England, assignor to International Standard Corporation, New York, N.Y.

Filed May 5, 1972, Ser. No. 250,534

Claims priority, application Great Britain, June 10, 1971, 19957/71

Int. Cl. G10l *1/00*

U.S. Cl. 179—1 SA **13 Claims**



There is disclosed herein a vocoder system having a multichannel speech analyzer, a multichannel speech synthesizer and an excitation system for extracting time-varying characteristics of the excitation function of the input speech signal and reproducing this function for the excitation of the synthesizer. The excitation system includes a speech extractor, a voiced/unvoiced detector, a pitch generator, a noise generator, a voiced/unvoiced switch and an output pulse generator. The pitch extractor operates on the short term envelope of the speech and is derived from a signal which is the sum of the signals of all analyzer channels. Constant width pulses are generated and integrated to form a varying d.c. signal proportional to the frequency of the extracted pitch. During voiced speech a multivibrator controlled by the d.c. signal produces the input to the output pulse generator. The output pulse generator produces an output pulse train of constant energy and is applied for excitation of the synthesizer channels. During unvoiced speech the noise generator drives the output pulse generator.

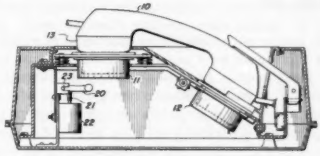
3,825,686
TELEPHONE HANDSET VIBRATOR

Hans Peter Kramell, Perry, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 19, 1973, Ser. No. 342,639

Int. Cl. H04m *1/64*

U.S. Cl. 179—1 C **3 Claims**



Apparatus for loosening the carbon which becomes packed in the transmitter of a telephone handset remaining at rest in an acoustic coupler for extended periods of time. A weighted arm is thrown against the coupler boot by a solenoid push rod.

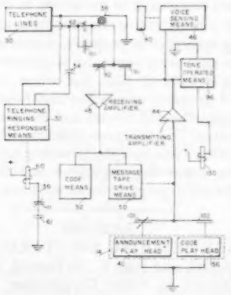
3,825,687
CODING MEANS FOR TELEPHONE ANSWERING DEVICE

Herbert H. Waldman, Brooklyn, N.Y., assignor to Electrospace Corporation, North Bergen, N.J.

Filed June 16, 1972, Ser. No. 263,412

Int. Cl. H04m *11/00*

U.S. Cl. 179—6 **12 Claims**



A coding device for energizing a desired article comprising a stepping member associated with manually movable switching members of a code selection portion of the coding device for determining a code sequence of a sound and silent

periods or intervals. A sound sensing portion activates a switch element of the code selection portion when a sound is transmitted thereto, so that the switch element is in a cooperating relationship with one of the switching members when a proper code is received, to provide connection with a closable element. A tone operated portion closes the closable element upon transmission of a tone to complete a circuit only after a proper code has been received. Each completion of the circuit activates the stepping member to move, in sequence after each proper code, until a position for closing another circuit which energizes the desired article is obtained. Preferably, the coding device is for a telephone answering device and is used to activate a play back switching member of a conventional message tape drive apparatus to rewind and play back a recorded message.

3,825,688

TELEPHONE ANSWERING APPARATUS WITH SYSTEM FAILURE DETECTION MEANS

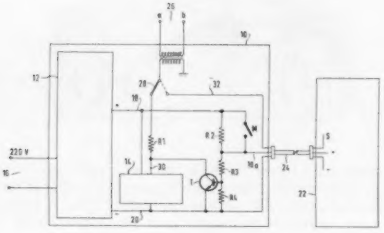
Arno Ritze, Munich, Germany, assignor to Compur-Werk Gesellschaft mit beschrankter Haftung & Co., Munchen, Germany

Filed Dec. 6, 1972, Ser. No. 312,786

Claims priority, application Germany, Dec. 10, 1971, 2161530

Int. Cl. H04m *11/10*

U.S. Cl. 179—6 R **7 Claims**



Telephone answering apparatus having a recording appliance connectable with the answering apparatus, and receiving its service voltage from the answering apparatus. The circuitry within the answering apparatus is such that if the recording appliance is not properly and effectively connected to the telephone answering apparatus, the answering apparatus is rendered ineffective to answer an incoming call. This is accomplished by an electronic switch in the telephone answering apparatus (the switch preferably being in the form of a transistor) responsive to variations in the resistance conditions of the circuit, the arrangement being such that when the recording appliance is properly connected and operative, the telephone answering apparatus is operatively connected to the incoming telephone line, but when the recording appliance is not properly connected and functioning, the connection between the call circuit and the incoming telephone line is ineffective. This is accomplished by the circuitry of the present invention even though the wiring connection between the telephone answering apparatus and the recording appliance may be of very simple form, such as a three wire cable.

3,825,689

MESSAGE METERING AND STORAGE SYSTEM

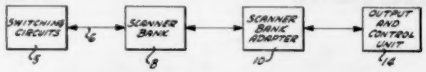
James R. Baichtal, and John C. McDonald, both of Los Altos, Calif., assignors to Vidor Corporation, Mountain View, Calif.

Filed Jan. 5, 1973, Ser. No. 321,275

Int. Cl. H04m *15/10*

U.S. Cl. 179—7 R **15 Claims**

Disclosed is a local metering system for metering information concerning each subscribers use of a telephone system. Each subscriber is associated with a unique location in memory. The subscriber lines are scanned in accordance with a binary addressing code from an address counter which does not necessarily access subscriber lines in their directory number order. The system storage output circuitry includes means for correlating the binary addressing with the subscriber line directory numbers. The system storage includes a circulating shift register memory which is stepped each time the address counter steps. The control circuitry and memory



cyclically test the system each cycle of the address counter. Specific locations in memory are assigned predetermined codes. Failure of the memories to properly read out the code when addressed indicates an error condition. Additionally, a test pattern is employed at directory number address locations. Once each cycle of the address counter the test pattern is compared with information decoded from the address counter to determine if the data paths and storage of the system are operating properly.

3,825,690

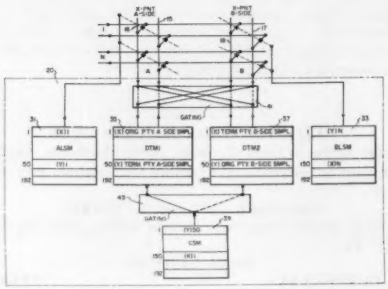
LOSSLESS NETWORK JUNCTOR FOR PCM DIGITAL SWITCHING SYSTEMS

Michael J. Kelly, Melrose Park; Alex W. Kobylar, Chicago, and Bernard J. Rekiere, Addison, all of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed June 1, 1972, Ser. No. 258,696

Int. Cl. H04j *3/00*

U.S. Cl. 179—15 AT **11 Claims**

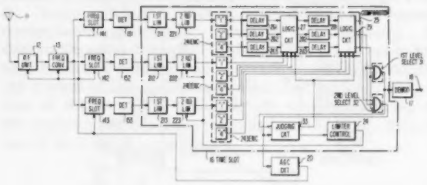


A network junctor for use with a switching network of a PCM digital switching system including two vertical access buses connectible through the functioning of two line switching memory LSM units to any two horizontal group buses of N number of group buses, two data transfer memory DTM units associated with the two access buses, respectively, for receiving, storing and transmitting channel information samples in the form of digital code words, a channel switching memory CSM unit for addressing a selected one of the DTM units to receive and transmit predetermined channel information, and gating means for selectively interconnecting the CSM unit to the selected DTM unit and the DTM units with the two vertical access buses. Each of the five memory units contain channel storage capacities corresponding to the number of time slots per frame capacity of any horizontal group bus.

3,825,691
F-T RADA RECEIVER WITH LEVEL DISCRIMINATION

Takamichi Honma; Shigeru Igarashi, and Hiroshi Harada, all of Tokyo, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan

Filed July 17, 1972, Ser. No. 272,514
Claims priority, application Japan, July 16, 1971, 46-53343
Int. Cl. H04j 3/00
U.S. Cl. 179—15 BA 13 Claims

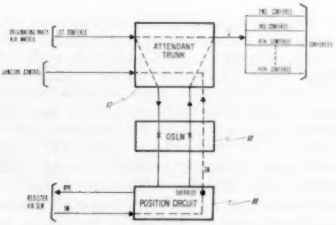


An F-T RADA receiver is provided with level discriminating means, including automatic gain control means. The level discriminating means exerts filtering action on the signal pulses having the frequency-time relation giving the probable address of the receiver with respect to the relative levels of such pulses so as not to produce the output signal from the signal pulses which are not of relatively uniform levels and are consequently judged to be signal pulses of false addresses but so as to produce the output signal from the signal pulses which are of relatively uniform levels and are accordingly discriminated as signal pulses of the true address.

3,825,692
SIMPLIFIED CONFERENCE FACILITY FOR PBX

Klaus Gueldenpfennig, Penfield; Uwe A. Pommerening, Webster, and Stanley L. Russell, West Webster, all of N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Sept. 29, 1972, Ser. No. 293,379
Int. Cl. H04m 3/56
U.S. Cl. 179—18 BC 6 Claims

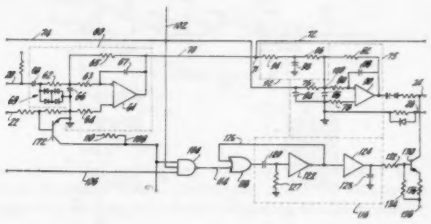


In an automatic private branch exchange where an operator may effect connection of a subscriber to a trunk circuit by connecting to an available register, inserting into the register the identity of the subscriber line circuit and forwarding a switch mark to the trunk from the register when the line circuit has been marked so that the trunk may acquire the services of the junctor control to complete its connection to the line circuit, a conference facility is made possible by controlling connection of the trunk to the junctor control directly from the switch mark without inhibition even when the trunk is already connected to another subscriber.

3,825,693
TIME DIVISION MULTIPLEX BRANCH EXCHANGE

William Ralph Smith, and Herman Deutsch, both of Raleigh, N.C., assignors to Tele/Resources, Inc., White Plaines, N.J.

Filed Sept. 25, 1972, Ser No. 291,960
Int. Cl. H04j 3/12
U.S. Cl. 179—15 AT 4 Claims

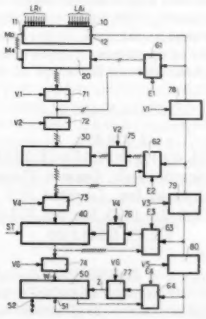


A time division multiplex branch exchange includes a plurality of stations that have audio input and output capacity. A pair of receiving wires and a pair of transmitting wires are connected to each station. A plurality of receiving amplifiers and transmitting amplifiers are attached to the transmitting and receiving wires of each station, respectively. A summing means, which may include an amplifier, combines the inputs produced during each of a series of time slots which recur at a predetermined frequency. Input and output gates are connected to the receiving and transmitting amplifiers and to the summing means. Particular circuitry is described including a three input AND gate used for generating ring signals and a disconnect timer activated by the hookswitch to prevent the hookswitch from signalling a line holding condition.

3,825,694
CONVERSATION DETECTOR FOR A TELEPHONIC CHANNEL CONCENTRATOR

Etienne Penicaud, Chaville, France, assignor to Compagnie Industrielle Des Telecommunications Cit-Alcatel, Paris, France

Filed Oct. 30, 1972, Ser. No. 301,734
Int. Cl. H04j 5/00
U.S. Cl. 179—15 AS 7 Claims

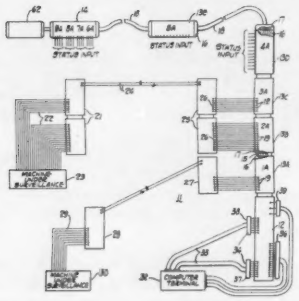


The samples tapped from a telephone channel are weighted according to the amplitude of each of them and the rhythm of the changes in polarity, the device deducing a "note" therefrom for each sample, positive or negative, calculating the sum of all the cumulated notes and deciding "conversation activity" if the cumulated note exceeds a certain threshold, and "non-activity" if the note passes below a second threshold lower than the previous one.

3,825,695
DIGITAL DATA INTERFACE SCANNING SYSTEM

Robert Gordon Long, Scarborough, Ontario, Canada, assignor to D.D.I. Communications, Inc., Lewiston, N.Y.

Filed Feb. 20, 1973, Ser. No. 333,486
Int. Cl. H04j 1/00
U.S. Cl. 179—15 A 30 Claims



An interface system is disclosed for digital data with the data appearing on a transmitter assembly as plural bits defining individual digitized words in a sentence. One or more words is established on each of a plurality of transmitter extenders and each transmitter extender is scanned in sequence by clock pulses. Enabling means is provided in the transmitter assembly which develops a check advance pulse as each extender is being scanned. Reset means establishes reset of the scanning means upon unequal outputs from the clock pulse and from the enabling means being supplied to a comparator, such as occurs at the end of the sequence of extenders.

A change detector is connected on each word input means to detect a change in any of the plural bits of a digitized word. As each extender is scanned, the scan passes through the extender by actuating the enabling means if there is no change in the word. If there is a change in the word, the change detector generates an interrupt signal which freezes the scan and established the status of the word on a plurality of conductors interconnecting the transmitter extenders. Address information as to the address of the changed word is produced and both the address information and status information is thus available to a computer which acknowledges the information and restarts the scanning. The foregoing abstract is merely a resume of one general application, is not a complete discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

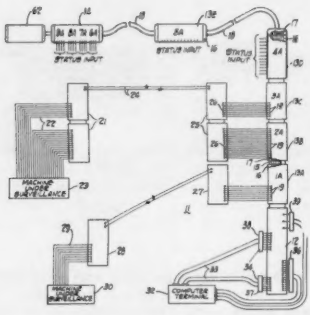
3,825,696
DIGITAL DATA INTERFACE SYSTEM

Robert G. Long, Scarborough, Ontario, Canada, assignor to D.D.I. Communications, Inc., Lewiston, N.Y.

Filed Feb. 20, 1973, Ser. No. 333,487
Int. Cl. H04j 1/00
U.S. Cl. 179—15 A 16 Claims

An interface system is disclosed for digital data with the data appearing on a transmitter assembly as plural bits defining individual digitized words in a sentence. One or more words is established on each of a plurality of transmitter extenders and each transmitter extender is scanned in sequence by clock pulses to determine simultaneously the status of all bits in a word. Enabling means is provided in the transmitter assembly which develops a check advance pulse as each extender or word is being scanned. Reset means establishes reset of the scanning means upon unequal outputs from the clock pulse and from the enabling means being supplied to a comparator such as occurs at the end of the sequence of extenders.

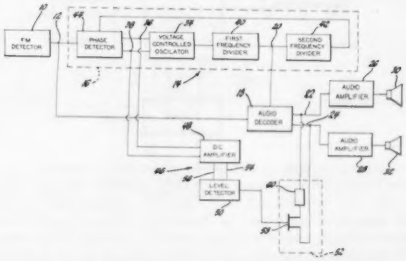
A change detector is connected on each word input means to detect a change in any of the plural bits of a digitized word. Upon detecting a change, an interrupt signal is generated. As each extender is scanned, the scan passes through the extender by actuating the enabling means if there is no change in the word. If there is a change in the word, the interrupt signal freezes the scan and establishes the status of the word on a plurality of conductors interconnecting the transmitter extenders. Address information as to the address of the changed word is produced and both the address information and status information is thus available to a computer which acknowledges the information and restarts the scanning. The foregoing abstract is merely a resume of one general application is not a complete discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.



3,825,697
PHASE-LOCK-LOOP FM-STEREO DECODER INCLUDING STEREOPHONIC/MONOPHONIC BLEND SYSTEM FOR REDUCING AUDIO DISTORTION

Thomas V. Cornell, Kokomo; Wayne A. Smith, Russiaville, and Lester Wilkinson, Kokomo, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed July 27, 1973, Ser. No. 383,243
Int. Cl. H04h 5/00
U.S. Cl. 179—15 BT 4 Claims



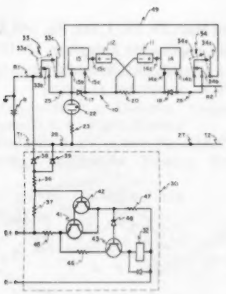
An FM-stereo decoder includes a phase-lock-loop for providing an error voltage and an audio decoder having L and R output channels upon which L and R audio signals are developed, respectively. In response to an initial predetermined increase in the error voltage due to the initiation of distorted reception, the separation between the L and R output channels is substantially instantaneously decreased to less than full channel separation thereby to rapidly shift toward full monophonic operation for reducing the discernible audio

distortion resulting from the distorted reception. Further, in response to a subsequent predetermined decrease in the error voltage due to the termination of distorted reception, the separation between the L and R output channels is relatively gradually increased to full channel separation thereby to slowly shift to full stereophonic operation for reducing the discernible audio disruption resulting from the shift to full stereophonic operation. Preferably, the separation between the L and R output channels of the audio decoder is varied during distorted reception from full channel separation to an intermediate channel separation which is greater than zero channel separation in proportion to the frequency of the L and R audio signals thereby to provide blended stereophonic/monophonic operation for reducing the discernible audio disruption resulting from the rather sudden shift toward full monophonic operation and for maximizing the amount of stereophonic operation over the lower frequencies of the L and R audio signals while minimizing the discernible audio distortion resulting from the higher frequencies of the L and R audio signals.

3,825,698
TEST-THROUGH CIRCUIT FOR TELEPHONE SYSTEM VOLTAGE BOOSTERS

Charles W. Chambers, Jr., Amherst, Ohio, assignor to Lorain Products Corporation, Lorain, Ohio

Filed July 31, 1972, Ser. No. 276,696
Int. Cl. H04q *1/30*
U.S. Cl. 179—16 F **5 Claims**



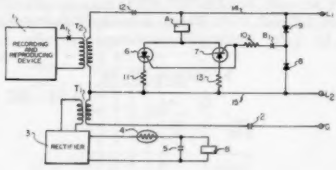
A circuit for automatically disconnecting a voltage booster circuit which is in service in a subscriber line to prevent the booster circuit from interfering with the taking of voltage and current measurements on the line. The circuit includes booster disconnect switches which, in a first operative state, connect the voltage booster circuit in current increasing relationship to a subscriber line and which, in a second operative state, disconnect the voltage booster from the line and substitute therefor a bypass conductor. A control circuit responsive to the voltage between either subscriber line conductor and a reference of fixed potential controls the booster disconnect switches, as required, to establish the first operative state thereof when the subscriber line is not being tested and to establish the second operative state thereof when the line is being tested.

3,825,699
CALLING PARTY CONTROL CIRCUIT

Dean W. Danner, Waukesha, Wis., assignor to GTE Automatic Electric Laboratories, Incorporated, Northlake, Ill.

Filed Nov. 29, 1972, Ser. No. 310,308
Int. Cl. H04m *1/64*
U.S. Cl. 179—81 R **7 Claims**

Two circuits are disclosed for loading a telephone line in response to the receipt of incoming ringing signals and includes means responsive to the calling party going on-hook to release the line. A unilateral switching device is included in

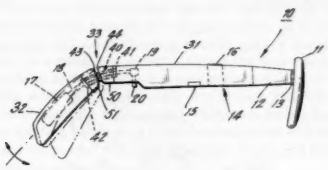


each circuit for loading and releasing the telephone line. Means responsive to incoming ringing signals are included to trigger the switching device into conduction to load the line.

3,825,700
ARTICULATED HEARING AID TEMPLE AND BEHIND-THE-EAR HEARING AID ELEMENT

Albert Jerry, Elmsford, and Jasper Baum, White Plains, both of N.Y., assignors to Sonotone Corporation, Elmsford, N.Y.

Filed Mar. 2, 1973, Ser. No. 337,628
Int. Cl. G02c *11/06*
U.S. Cl. 179—107 S **3 Claims**



A temple piece hearing aid for eyeglasses in which the temple piece comprises two sections, one in front of the ear connectible to a hinge stub on the eyeglass frame and a second behind the ear; the two sections are hingedly connected for universal movement and adjustment of the behind the ear section with respect to the front section, the hinge connection being of a "stay-put" type or similar construction having a tubular passage adapted to pass a sound tube and circuit connecting elements therethrough in a protective fashion; thereby permitting the temple piece sections to be made of any useful or desired material and obviating the prior limitation of the use of a thermoplastic casing with an over-the-ear section which required heat treatment, with attendant possible deleterious effects of heat, for adjustment.

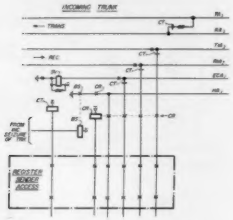
3,825,701
ARRANGEMENT AND METHOD FOR DETECTING FAULTS IN A SWITCHING NETWORK

Melvin A. Jacobs, Hinsdale, Ill., assignor to GTE Automatic Electric Laboratories, Incorporated, Northlake, Ill.

Filed May 4, 1973, Ser. No. 357,310
Int. Cl. H04m *3/24*
U.S. Cl. 179—175.23 **17 Claims**

This invention relates to a marker used to detect faults within the switching network, prior to a cross matrix path being established, but after an idle path as been selected. The selected path is subjected to various tests including a foreign

potential check, a multi-path (shorted leads) check, a shorted diode test, open diode test, a pull check, a hold check and a transmission continuity test. If any one or more of these tests fail, the marker will not use the path, will report the trouble and then select another path.

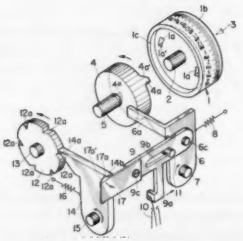


3,825,702

OPERATING MECHANISM FOR TWENTY FOUR HOUR CYCLE DIGITAL TIMER

Kingo Murata, Shiki, and Kaoru Wakabayashi, Tokyo, both of Japan, assignors to Kabushiki Kaisha Koparu, Tokyo-to, Japan

Filed Jan. 17, 1973, Ser. No. 324,405
Claims priority, application Japan, Jan. 19, 1972, 47-8599
Int. Cl. H01h *7/08*
U.S. Cl. 200—35 R **4 Claims**



A timer mechanism for a clock or the like arranged, in order to have the switch opening and closing operations performed accurately and reliably at preset times, so that a clutch operating member, which is held in operable condition by cooperative action of a timer setting member and clutch cam member, is released by cooperative action of a clutch controlling member rotating being synchronized with the minute shaft of the clock device and of a clutch control transmitting member.

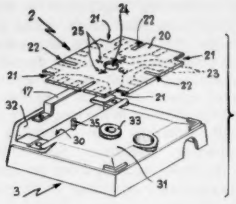
3,825,703

SWITCH FOR MULTISPEED ELECTRIC MOTOR

Georges Berthier, Villeurbanne, France, assignor to Emerjy, Villeurbanne, France, a part interest

Filed Feb. 14, 1973, Ser. No. 332,266
Claims priority, application France, Feb. 23, 1972, 72.06739
Int. Cl. H01h *43/08*
U.S. Cl. 200—46 **9 Claims**

A switch for instantaneous control of the speed of an electric motor associated with electric pumps, central heating circulators, fans, air conditioners, and the like apparatus. The switch comprises a contact holder element provided with a recess engaged by one of the sides of a removable polygonal plate whose sides are provided with printed connections designed according to different diagrams.

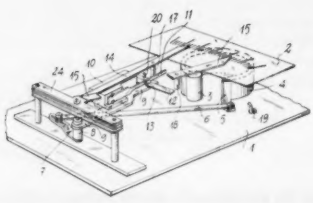


3,825,704

MICROSWITCH DEVICE ACTUATABLE AT TWO PRESET VALUES OF A MEASURABLE VARIABLE

Gualtiero Brauer, Milan, Italy, assignor to Facem Fabbrica Apparecchi Controllo e Misura di Gualtiero Brauer, Milano, Italy

Filed Mar. 29, 1973, Ser. No. 345,898
Claims priority, application Italy, Apr. 11, 1972, 23008/72
Int. Cl. G01d *13/26*
U.S. Cl. 200—56 R **7 Claims**



Device for regulating between a maximum and a minimum the value for a variable, such as a pressure or a temperature. The device comprises an element moving as the controlled variable value changes and moving through a kinematic motion a microswitch having an operating lever extending between two manually movable pointers and defining the maximum and minimum values for the variable.

3,825,705

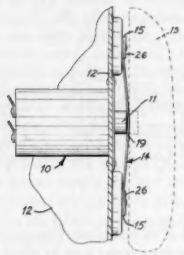
DEVICE FOR DEACTIVATING AUTOMOBILE DOOR OPERABLE ELECTRIC SWITCH

Hubert Bourton, Star Rt., Waterville, Wash. 98858

Filed Aug. 20, 1973, Ser. No. 389,522
Int. Cl. H01h *3/16*
U.S. Cl. 200—61.79 **4 Claims**

A device is described herein for use in deactivating automobile door-operable switches. The device basically comprises a non-stretchable elongated strap having the ends thereof fixed

to magnetic elements. A central portion of the strap is exposed of sufficient length to enable the magnetic elements to be secured to a door post on either side of a door-operable



switch. When in position, the central portion of the strap engages and holds the switch button depressed to enable an individual to leave the vehicle door open without activating the dome light or warning buzzer usually activated by the switch.

3,825,706

FLUID PRESSURE UNBALANCE INDICATOR WITH PLURAL PISTONS

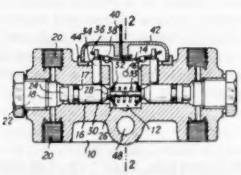
Guy Papiau, Arnouville Les Gonesse, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Feb. 5, 1973, Ser. No. 329,791

Claims priority, application France, Feb. 10, 1972, 72.04463

Int. Cl. H01h *35/38*

U.S. Cl. 200—82 D **2 Claims**



A fluid pressure unbalance indicator comprising two separate pistons respectively subjected to forces created by the pressure prevailing in two independent fluid circuits, the pistons acting in opposition to one another and being mounted in a housing so as to move in conjunction with one another and to operate electrical contact members under the influence of a pressure difference which denotes failure of one of the fluid circuits and which produces a force capable of overcoming the force of a resilient system associated with the pistons. In the invention, the resilient system is situated in a region of the housing accessible to both pistons, and each end of the resilient system bears on a fixed portion of the housing and is engageable by the piston subjected to the higher of the fluid pressure forces.

3,825,707

SWITCHING DEVICE FOR INDICATING THE LOADING OF A VEHICLE SEAT

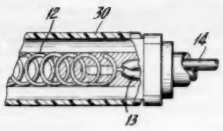
Dieter Hanselmann, and Hans Prohaska, both of Bietigheim, Wurttemberg, Germany, assignors to SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH, Bietigheim, Germany

Continuation-in-part of Ser. No. 255,068, May 19, 1972, abandoned. This application June 8, 1973, Ser. No. 368,086

Claims priority, application Germany, May 21, 1971, 2125198

Int. Cl. H01h *3/14*

U.S. Cl. 200—85 A **5 Claims**



A switching device for indicating the loading of a vehicle seat includes a contact assembly comprising two resilient contact bands which are spaced apart by insulation holders and which will flex together upon loading of a seat to actuate an indicating circuit. The contact assembly advantageously comprises a band assembly of a form to be positioned in a major portion of the seat which is loaded by a person occupying the seat and it includes two terminals extending outwardly from the band which are adapted to be simply connected to a circuit for indicating, for example, when the seat is occupied and loaded and when the occupant has not fastened his seat belt. The band assembly may be of a shape such as an O, U, V or Z configuration and extend over a greater part of the surface of a seat and be embedded directly within the seat upholstery or a seat cushion and each band comprises a continuous flat helical spring with successive coils laying flat and being overlapped in contacting relationship. Adjacent bands are bendable upon loading of the seat to permit lateral as well as vertical movement to permit them to be easily displaced together in contacting engagement.

3,825,708

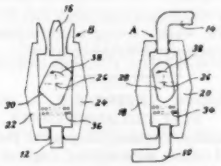
METHOD AND MEANS FOR BREAKING A HIGH-POWER CIRCUIT

Kurt Tage Lennart Bergman, Sundsvall, Sweden, assignor to Kafak Aktiebolag, Sundsvall, Sweden

Filed Apr. 6, 1972, Ser. No. 241,662

Int. Cl. H01h *33/12*

U.S. Cl. 200—146 R **5 Claims**



A method of breaking a high-power current passing through a switch is characterized by transferring the current to a contact member which is then opened. The switch includes two groups of stationary contact members and a movable contact member, cams being provided to vary the opening and closing positions of the groups.

3,825,709

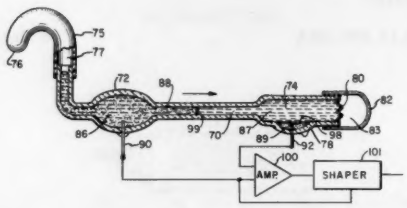
TRANSDUCER DEVICE

Arsene N. Lucian, P.O. Box 300, Manasquan, N.J. 08736

Continuation-in-part of Ser. No. 37,965, May 18, 1970, Pat. No. 3,701,868. This application Oct. 27, 1972, Ser. No. 301,268

Int. Cl. H01h 29/00

U.S. Cl. 200—192 16 Claims



A transducer using the electrocapillary effect at a single interface of a liquid metal and an electrolyte in which the metal is moved, by a force applied thereto, to disturb the interfacial tension, to result in the production of a voltage.

3,825,710

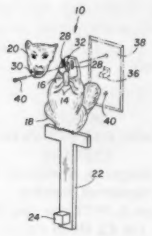
ANIMATED OPERATOR FOR ELECTRICAL SWITCHES

Stuart J. Roberts, Denville, N.J.; Harold Rosenbaum, 29 Brittany Rd., Montville, N.J. 07045, and Sol Inspector, 59 Fairfield Ave., West Caldwell, N.J. 07006, assignors to said Rosenbaum and Inspector, by said Roberts

Filed Sept. 10, 1973, Ser. No. 396,068

Int. Cl. H01h 3/02

U.S. Cl. 200—172 A 9 Claims



An animated operator for use with an electrical switch of the lever type in which the switch lever may be operated from a distant position while causing a corresponding animated movement to be performed by the operator.

3,825,711

ELECTRICAL SWITCH

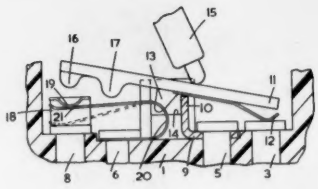
Keith Lewis, Burnley, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed Mar. 26, 1973, Ser. No. 344,552

Int. Cl. H01h 5/18

U.S. Cl. 200—67 G 5 Claims

An electrical switch comprises a plurality of fixed contacts and a movable contact mounted on a carrier. There is provided an operating member which effects movement of the carrier between a first position in which the movable contact electrically interconnects the fixed contacts and a second position in which the movable contact is spaced from the fixed contacts. The switch also includes further fixed contacts which are associated with a resilient conducting member. The resilient conducting member is electrically connected to a first of the further fixed contacts and is biassed to be connected electrically with a second of the further fixed contacts when



the carrier is in one of its positions. The carrier includes a projection which, when the carrier is in its other position, engages the resilient member, and urges it out of connection with the second of the further fixed contacts and into electrical connection with a third of the further fixed contacts.

3,825,712

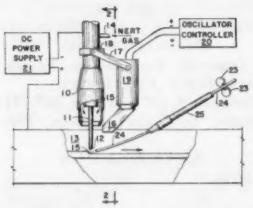
WELDING PROCESS

Francis E. Gibbs, Pleasanton, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Aug. 3, 1972, Ser. No. 277,566

Int. Cl. B23k 9/00

U.S. Cl. 219—137 15 Claims



This invention relates to a narrow-groove Gas-Tungsten-Arc (GTA) welding process for the butt welding of thick aluminum plates wherein the arc is oscillated across the width of the groove at a frequency between 100 and 300 cycles per minute. Shorter welding times and improved weldment soundness are obtained.

3,825,713

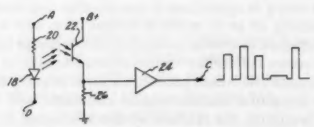
FUNCTION CONTROL CIRCUIT FOR EDM POWER SUPPLY

Oliver A. Bell, Jr., Mooresville, N.C., assignor to Colt Industries Operating Corp., New York, N.Y.

Filed May 8, 1972, Ser. No. 251,352

Int. Cl. B23k 9/16

U.S. Cl. 219—69 G 15 Claims



A system for controlling an electrical discharge machining apparatus wherein the system is rendered responsive to an

electrical gap parameter such as gap current or gap voltage level. Included in the system for responding to gap condition is a sensing circuit which includes a light-emissive device connected in circuit with the gap or with other essential operating elements such that there is provided a light output of an intensity proportional to gap current or voltage. A second, light responsive device such as a phototransistor or photo diode is used to convert the light signal into an electrical control signal, which signal in turn is utilized in a function control for the electrical discharge apparatus. The function control exercised includes machining power pulse on-time and off-time control, interruption of machining power responsive to gap short circuit condition, servo feed by providing relative movement of controllable speed and direction between a tool electrode and the workpiece, the gap width, and interruption of the power for the power supply in order to protect against gap short circuit condition arising from failure of an essential switching element in the EDM power supply such as one of the output electronic switches.

3,825,714

METHOD AND APPARATUS FOR CONTROLLING THE FEED OF AN ELECTRODE-TOOL RELATIVE TO A WORKPIECE IN ELECTRICAL DISCHARGE MACHINING

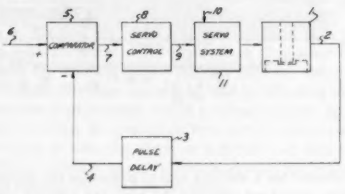
Georges-Andre Marendaz, Geneva, Switzerland, assignor to Ateliers des Charmilles S.A., Geneva, Switzerland

Filed May 15, 1973, Ser. No. 360,407

Claims priority, application Switzerland, May 17, 1972, 7292/72

Int. Cl. B23k *9/16*

U.S. Cl. 219—69 G **12 Claims**



A method and apparatus for controlling the advance, or feed, of an electrode-tool relative to a workpiece in electrical discharge machining, such as to provide maximum material removal efficiency and minimum electrode-tool wear. The control of the advance, or feed, of the electrode-tool is achieved by comparing a reference magnitude of predetermined value with an achieved magnitude depending upon the machining conditions, the achieved magnitude being obtained by measuring the random time delay between the moment at which a machining voltage pulse is applied across the machining gap between the electrode-tool and the workpiece and the moment at which an electrical discharge occurs across the gap.

3,825,715

PROCESS FOR CONTROLLING ELECTRICAL DISCHARGE SHAPING

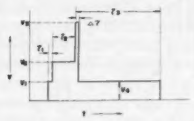
Nagao Saito; Kazuhiko Kobayashi, both of Nagoya, and Shigeru Takagi, Kasugai, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Chiyoda-ku, Japan

Filed May 29, 1973, Ser. No. 364,420

Int. Cl. B23k *9/16*

U.S. Cl. 219—69 M **8 Claims**

A process for electrical discharge shaping a workpiece by impressing a pulse voltage across a working gap between the workpiece and an electrode, wherein a waveform of the pulse is controlled by effectively discharging the pulse. The working gap is controlled, so as to contribute to stable processing, depending upon the controlled pulse waveform. A pulse time width is divided into three intervals. When the discharge is formed during the first time interval the electrode movement



is controlled to increase the working gap. When the discharge is formed during the second time interval, the electrode movement is controlled to maintain the working gap. When the discharge is formed during the third time interval or no discharge is generated, the electrode movement is controlled to decrease the working gap.

3,825,716

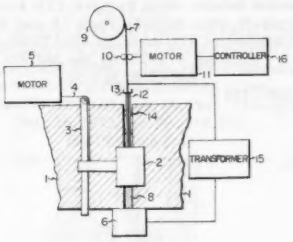
ELECTROSLAG WELDING METHOD

Satoshi Kokura; Genzi Taki, and Kiyoshi Watanabe, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sept. 29, 1972, Ser. No. 293,510

Int. Cl. B23k *25/00*

U.S. Cl. 219—73 **13 Claims**



An electroslag welding method utilizing, as its heat source, the resistance heat created in a molten slag during passage of current therethrough, in which a consumable guide is disposed in an opening that is, the groove defined by parent metals for guiding a welding electrode and fixed relatively centrally of groove by means of solid pieces of a flux so as to preclude electric shorting occurring between guide and the groove faces of said parent metals, and then a welding electrode in the form of a ribbon is fed through said consumable guide from a reel of said welding electrode.

3,825,717

HAMMERING CIRCUIT FOR STUD WELDING APPARATUS

James S. Hughes, Jr., Bellmawr, N.J., assignor to Omark Industries, Inc., Portland, Oreg.

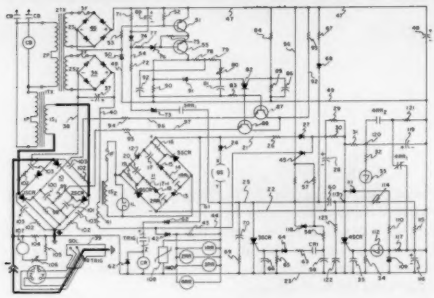
Filed Feb. 14, 1973, Ser. No. 332,390

Int. Cl. B23k *9/00, 11/04*

U.S. Cl. 219—98 **11 Claims**

Stud welding apparatus including circuitry for effecting a hammering action of the stud against the workpiece to break through paint, scale, etc. to establish good electrical contact. The stud welding gun includes a lifting solenoid and the hammering is effected, in one species, by converting the solenoids normal full wave rectified input to half wave rectified output and in a second embodiment by interrupting the DC power supply to the gun solenoid through a solid state device by an associated frequency variable multivibrator. Hammering is

discontinued upon the sensing of the establishment of welding current across the stud and workpiece in one species and in a second by continuing hammering until the electrical re-

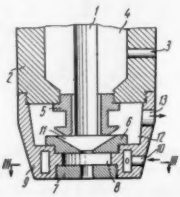


sistance across the stud and workpiece reduces to a predetermined level. A safety timer circuit is employed to discontinue hammering after a predetermined time irregardless of the establishment of acceptable electrical contact.

3,825,718
PLASMATRON

Otari Yakovlevich Mosiashvili, ulitsa Perovskoi, 15; Robert Nikolaevich Suladze, ulitsa Barnova, 112; Ivan Isidorovich Navdarashvili, ulitsa Imgvsky Tupik 14, and Mikhail Georgievich Devdariani, 4 Barnova, 20, all of Tbilisi, U.S.S.R.

Filed Dec. 8, 1971, Ser. No. 205,975
Int. Cl. B23k *9/00*
U.S. Cl. 219—121 P **3 Claims**



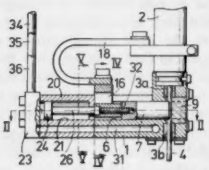
A consumable cathode plasma arc torch for working metals with a water-stabilized plasma arc in which a tubular nozzle is mounted in co-axial relationship to the cathode with the lower lateral surface thereof in coplanar relationship with an upper lateral surface of one of two tandenly mounted arc forming nozzles. This relationship increases the reliability and efficiency of the plasma arc torch by decreasing the possibility of cooling liquid getting into the arc-forming nozzles and by decreasing the distance between the lower end of the cathode and the inner arc-forming nozzle.

3,825,719
CONTACT NOZZLE FOR A CONTINUOUS ARC WELDING ELECTRODE

Sven Jonas Roland Jonsson, Laxa, Sweden, assignor to Elektriska Svetsningsaktiebolaget, Gothenburg, Sweden

Filed June 18, 1973, Ser. No. 371,310
Claims priority, application Sweden, June 22, 1972, 8287/72; Sweden, Dec. 19, 1972, 16597/72
Int. Cl. B23k *9/00*
U.S. Cl. 219—130 **3 Claims**

A contact nozzle for supplying welding current to a continuous, fusible arc welding electrode in which a pneumatic cylinder or other resilient means maintain a contact member in engagement with an electrode backed on the opposite side

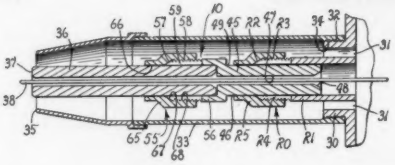


by a wear-resistant, electrically nonconducting or poorly conducting backing member.

3,825,720
ADAPTER FOR A MIG WELDER

Adam J. Zillinger, Jr., 148 Minnewawa Ave., Fresno, Calif. 93727

Filed July 27, 1973, Ser. No. 383,098
Int. Cl. B23k *9/26*
U.S. Cl. 219—130 **3 Claims**



An adapter for a welding tool to maximize the useful life of a welding wire feed tube for the tool, the adapter having an elongated tool engaging shank; a tube receiving sleeve borne by the shank; and a tube lock ring secured on the sleeve.

3,825,721
ELECTRODE FOR VERTICAL-UP OPEN ARC WELDING USING MOLDING SHOES

John E. Carroll, Chagrin Falls, and Carl E. Stump, Euclid, both of Ohio, assignors to The Lincoln Electric Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 216,233, Jan. 7, 1972, abandoned. This application Jan. 4, 1973, Ser. No. 317,352
Int. Cl. B23k *35/22*
U.S. Cl. 219—146 **9 Claims**

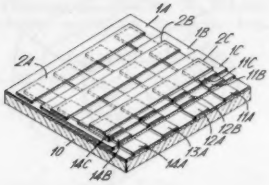
A cored-type welding electrode for vertical-up welding using molding shoes to hold the molten metal in position, using an open arc which does not require an externally-supplied shielding gas and which permits very high linear welding speeds. The core materials include a metal fluosilicate capable of breaking down in the heat of the arc to produce: a gas in sufficient volume to shield the arc from the atmosphere and a slag forming ingredient; and, other slag forming ingredients including the metal oxides and the alkali metal fluorides in a critical volume such that the total slag forming ingredients do not exceed six percent of the total electrode weight and the oxides are present in quantities at least greater than the fluorides. The self-shielded electrode further permits the use of active deoxidizers in quantities of under 0.5 percent.

3,825,722

THERMAL PRINTING HEAD

Hideo Taniguchi, Kyoto, Japan, assignor to Toyo Electronics Industry Corp., Kyoto, Japan

Filed Mar. 8, 1973, Ser. No. 339,431
Claims priority, application Japan, Mar. 16, 1972, 47-26794
Int. Cl. H05b *1/00*
U.S. Cl. 219—216 10 Claims



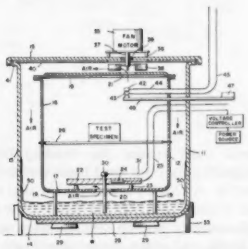
A thermal printing head comprising a plurality of thin insulating layers each being provided on one surface thereof with a plurality of electrically conductive slips arranged in spaced parallel relation to one another. The insulating layers are piled stepwise one upon another so that one end portion of the upper surface of each of the layers with the corresponding end portions of the conductive slips thereon are exposed from beneath the end of the layer immediately above. A slip of an electrically resistive material extends transversely of and in contact with the exposed end portions of the conductive slips on each of said insulating layers, so that between each adjacent two of the conductive slips on all the insulating layers there are defined a plurality of dot-like portions of the resistive slips which are arranged in rows and columns on the printing surface of the head. Upon impression of a voltage between adjacent pairs of the conductive slips those defined portions of the resistive slips which are between the adjacent pairs of conductive slips are heated, and by selecting the pairs of conductive slips between which a voltage is to be applied it is possible to cause the heated defined dot-like portions of the resistive slips to take the shape of a symbol, so that when a sheet of heat-sensitive paper is pressed against the heated portions, the symbol is printed on the paper.

3,825,723

TEMPERATURE AND HUMIDITY TEST APPARATUS

John O. Roeser, Arlington Heights, Ill., assignor to Otto Engineering, Inc., Carpentersville, Ill.

Filed Feb. 14, 1973, Ser. No. 332,376
Int. Cl. F27d *11/02*
U.S. Cl. 219—401 14 Claims



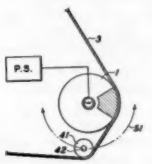
An apparatus is provided for subjecting specimens such as electric switches and other components to a temperature and humidity controlled environment, particularly to a cycling environment which involves changes in relative humidity and temperature. The apparatus includes an inner drum nested within an outer drum so that the walls of the inner drum are spaced from the walls of the outer drum. The inner drum provides the specimen chamber, and an air inlet and air outlet are provided through the bottom and the top, respectively, of the inner drum. The bottom portion of the outer drum below the bottom of the inner drum serves as a water reservoir, and an electric heater is mounted on the bottom of the outer drum for heating the water contained in the outer drum. A thermostat within the water is operatively connected to the heater to maintain the temperature of the water at the desired level. A second heater is mounted within the inner drum adjacent the air inlet, and electrical control means are connected to the second heater so that the second heater supplies a constant amount of heat. An air blower or impeller is mounted on the outer drum above the air outlet of the inner drum, and the air impeller provides air flow from the air outlet, around the sides of the inner drum, over the water reservoir, through the air inlet, and through the specimen chamber. The air is heated to just below the desired test temperature as it passes over the heated water and becomes saturated with water. As the air passes through the air inlet into the specimen chamber, the seacond heater supplies just enough heat to raise the temperature of the air to the desired test temperature and to decrease the relative humidity of the air to the desired test humidity. Wet bulb and dry bulb thermocouples may be mounted within the specimen chamber and connected to a suitable recording device to record the wet bulb and dry bulb temperature conditions within the specimen chamber.

3,825,724

WRAP ADJUST DEVICE FOR CONTROLLING ENGAGEMENT BETWEEN A WEB AND ROLLER

William Kingsley, and Robert F. Allis, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 171,819, Aug. 16, 1971. This application Dec. 26, 1972, Ser. No. 318,322
Int. Cl. H05b *1/02*
U.S. Cl. 219—469 18 Claims



The temperature of a heat sensitive web is controlled by varying the contact area between the web and a thermo roller having an appropriate thermo energy device coupled to it. A wrap adjust roller is supported for movement along a circular path concentric with the periphery of the thermo roller and varies the surface area contact between web and thermo roller at different locations relative to the thermo roller.

3,825,725

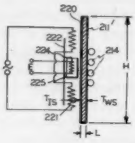
THERMAL SYSTEMS INCORPORATING APPARATUS AND METHODS FOR SIMULATING TIME RELATED TEMPERATURES

Frank W. Leitner, and Bobby B. Childress, both of Charlotte, N.C., assignors to Coltron Industries, Inc., Charlotte, N.C.

Division of Ser. No. 779,778, Nov. 29, 1968, Pat. No. 3,586,830. This application June 9, 1971, Ser. No. 151,563
Int. Cl. H05b *3/06*
U.S. Cl. 219—530 10 Claims

Methods and apparatus for establishing and controlling thermal systems wherein sensing means may anticipate or log temperature conditions at other points, such as at the work or

loads and wherein the controlled heating means are related to the thermal capacity of the system. The simulation of load



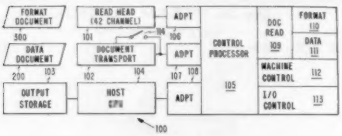
temperature, regardless of presence of anticipation, is obtained even under varying load conditions.

3,825,726

MULTIPLE FORMATTING FOR RECORD-CONTROLLED MACHINES

Richard L. Dorr, Rochester, Minn.; Edward G. Ihnot, Endwell, N.Y., and Malcolm E. Varner, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 18, 1973, Ser. No. 352,392
Int. Cl. G06k *15/00*; **G06f** *7/00*
U.S. Cl. 235—61.6 R **14 Claims**



A mark-reading machine, or other record-controlled device, produces an output record from indicia on a data documents, in accordance with specifications on one of a number of format documents. The data documents contain selection indicia, such as preprinted marks, for identifying which of the format documents applies thereto.

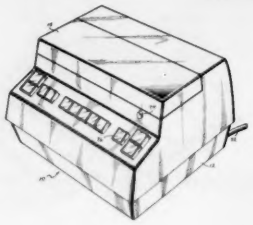
3,825,727

EMBOSSED CARD READER AND IMPRINTER

Domenico S. Sarcia, Winchester, Mass., assignor to Amron Research and Development Corporation, Longmeadow, Mass.

Filed Aug. 22, 1972, Ser. No. 282,715
Int. Cl. G06k *13/07*; **B41l** *45/12*; **B65h** *5/06*; **G06k** *1/12*
U.S. Cl. 235—61.11 R **17 Claims**

An embossed card reader and sales draft imprinter which employs a spring clutch drive assembly for driving an embossed card through a card reading station and an imprinting station. A guide plate assembly is provided for initially positioning the embossed card with respect to the card reading station. Spring-loaded embossment followers responsive to the presence or absence of an embossment are located at the card reading station. These followers are used to modify the amount of light impinging upon a plurality of photodetectors in accordance with the presence or absence of the embossment. The output signals from the photodetectors are decoded



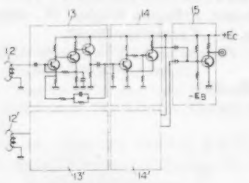
to provide a reading of the alphanumeric embossments on the card. After passing through the card reading station, the embossed card is brought into physical contact with a carboned sales draft to imprint thereon the embossed information on the card.

3,825,728

MAGNETIC CARD READER

Shunsaku Nakauchi, Mitaka, and Masanori Hirasawa, Tokyo, both of Japan, assignors to Tokyo Magnetic Printing Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1973, Ser. No. 339,220
Claims priority, application Japan, Mar. 14, 1972, 47-25212
Int. Cl. G06k *7/08*; **G11b** *5/68*
U.S. Cl. 235—61.11 D **5 Claims**



A magnetic card reader for reading out digital code recorded magnetically on a card independently of variations in card velocity. A clock pulse signal is also recorded on the card and the reader reads out the digital code and clock pulse signal simultaneously and in synchronism with each other. The digital code and clock pulse signal are compared at a constant level in a detecting device so that only accurate digital code signals are read. The detecting device comprises amplifiers which reduce the degree of amplification in proportion to input frequency increases and which are connected respectively to each magnetic head and an AND

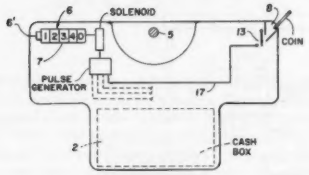
circuit to which the amplifier outputs are synchronously applied after being level-sensed.

3,825,729

CASH BOX WITH COIN COUNTER

Wilhelm Menke, Bingen, Germany, assignor to NSM-Apparatebau GmbH, Bingen/Rhein, Germany

Filed Aug. 23, 1972, Ser. No. 283,222
Claims priority, application Germany, Aug. 26, 1971, 2142776
Int. Cl. G06m *3/08*
U.S. Cl. 235—92 CN **2 Claims**



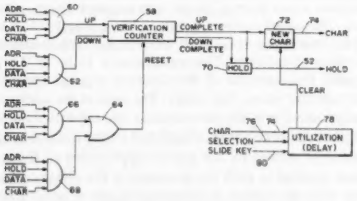
In a coin operated machine such as a vending machine, jukebox or gaming device, a cash box is provided with a register operated by coins passing through a slot in the cash box for continuously indicating the total value of coins in the cash box.

3,825,730

TWO-WAY PROJECTION SYSTEM FOR DATA INPUT

Harvey R. Worthington, Jr., Concord; Edward B. Rawson, Lincoln, and Daniel B. Schwarzkopf, Stow, all of Mass., assignors to Searle Medidata, Inc., Waltham, Mass.

Filed Nov. 7, 1972, Ser. No. 304,554
Int. Cl. G06m *11/00*
U.S. Cl. 235—92 V **14 Claims**



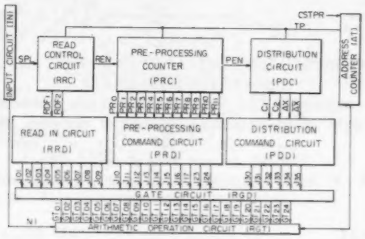
A data input terminal comprising a two-way projection system for the selection of desired input messages from a library of selectable messages. The library of messages is optically displayed in groups on a projection screen and selection of desired messages from the projected group is optically detected to provide electrical output signals representing screen locations corresponding to the selected messages.

3,825,731

NUMERICAL CONTROL SYSTEM

Kengo Kobayashi, Kawasaki; Mitsuo Manabe, Tokyo, and Shinichi Isobe, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki-shi, Japan

Continuation-in-part of Ser. No. 104,086, Jan. 5, 1971, abandoned. This application Jan. 5, 1973, Ser. No. 321,363
Claims priority, application Japan, Jan. 30, 1970, 45-7958
Int. Cl. G06f *15/46*
U.S. Cl. 235—151.11 **3 Claims**



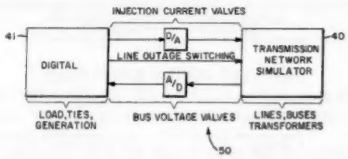
In the numerical control mode of the present invention, an incremental command and an absolute command are used together within a single block, thereby simplification of the programming process and extreme preciseness in the numerical control system being achieved.

3,825,732

HYBRID POWER SYSTEM MODULES

Paul H. Haley, Pittsburgh, Pa., and Mark K. Enns, Ann Arbor, Mich., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 19, 1972, Ser. No. 255,246
Int. Cl. G06g *7/62*
U.S. Cl. 235—151.21 **18 Claims**



Loadflow computer arrangements include a modularized analog network simulator which includes modular circuits representing power system generators and loads, as well as buses and lines. The modular generator circuit generator is constrained by scheduled generator electrical power and voltage magnitude values, and the modular load circuit is constrained by scheduled load power values. The modular bus, line, generator and load circuits are interconnected to simulate the power system and operate to force currents and voltages to satisfy current and voltage laws to provide the bus voltage solution.

3,825,733

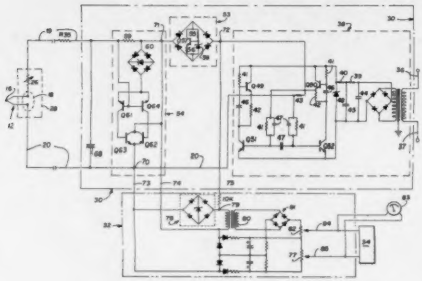
TELEMETRY METHOD AND APPARATUS

Dowell White, 1312 Jessie Ln., Pasadena, Tex. 77502, and Daniel L. Craig, 225 Burwell, Highlands, Tex. 77562

Filed Aug. 11, 1971, Ser. No. 170,736
Int. Cl. G06g *7/62*
U.S. Cl. 235—151.31 **60 Claims**

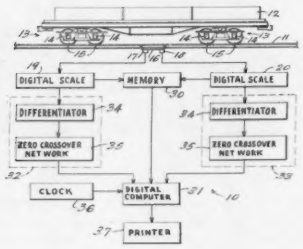
A method and apparatus for telemetry, wherein first and second electrical signals are generated and applied across a

remotely located electrical quantity, such as voltage or resistance, desired to be measured. The interaction of such first and second electrical signals with the electrical quantity to be



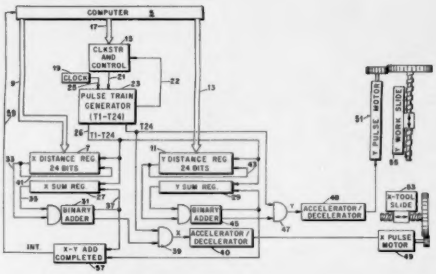
measured produces first and second resultant electrical signals which are used by a computer or analog portion of the telemeter to determine the value of the electrical quantity in question.

3,825,734
MONITOR FOR MOVING VEHICLES
Norman H. Jacobs, Petersburg, Mich., and William C. Susor, Oregon, Ohio, assignors to Reliance Electric Company, Toledo, Ohio
Filed Mar. 14, 1973, Ser. No. 341,302
Int. Cl. G06f 15/20; G06g 7/48
U.S. Cl. 235—151.33 **14 Claims**



Apparatus for monitoring vehicles moving along a predetermined path, such as a train moving along a railroad track. A least two digital scales are positioned in the path and in a first embodiment include at least two load cells which are spaced apart less than the minimum axle spacing on the vehicles for successively measuring the axle weights of the moving vehicles. In a second embodiment, the load cells have a spacing greater than the maximum axle spacing on a truck at one end of a railroad car. The direction and speed of the vehicles are determined from the sequence and the time interval between peak outputs from the scales as the axles move sequentially over the scales. From the scale outputs, the apparatus may also determine when the vehicles stop or change direction, count the number of vehicles moving along the path, measure the total weight of each vehicle and identify the types of vehicles moving along the path. The output peaks from the scales are compared for detecting a failure in either scale during operation of the apparatus which would cause the peak weights to deviate by more than a permissable tolerance.

3,825,735
COMMAND PULSE GENERATOR FOR COMPUTER-CONTROLLED MACHINING
Gary L. Bowers; Clark M. Lay, both of Clinton, and Albert E. Stephens, Knoxville, all of Tenn., assignors to The United States of America as represented by the United States Atomic Energy Commision, Washington, D.C.
Filed Nov. 12, 1973, Ser. No. 415,078
Int. Cl. G05b 19/40
U.S. Cl. 235—151.11 **6 Claims**



A system has been provided for generating travel command pulses in a machine tool positioning system under computer control which reduces computer computation time and at the same time allows increased machine tool travel speed. Pulse motors driven by pulse trains generated by the system under computer control provide the means for axis movement of the tool. The pulse trains for the axes movements are generated by an addition technique in a hardware hydrid digital differential analyzer. A 24-bit word representing the distance to be traveled along an axis is loaded from the computer core memory into a 24-bit distance register along with an 11-bit word loaded into a 11-bit clock store register which defines the amount of time allowed for tool travel corresponding to the given distance value. Addition is performed serially for each axis in parallel by corresponding 2-bit binary full adders having one input from the particular 24-bit distance register and another input from a 24-bit sum register which is initially cleared. The clock store register, after being loaded by the computer, loads the value into a counter which is counted to an overflow condition. This generates a train of 24 pulses which shift the contents of the distance register and the sum register into the binary full adder. The sum at the adder output is serially loaded into the sum register and repeatedly added to the original distance value, circulated in the distance register, at a rate determined by the rate of application of the train of 24 pulses applied to shift the contents of the distance and sum registers into the adder. A command pulse is generated each time the 24th pulse of a pulse train is generated provided there is an enable due to an overflow in the adder. The time interval between each 24-bit serial addition is determined by the value stored in the clock store register. The addition process is complete for a specific block when a marker bit is in the left-most bit position followed by all zeros in the sum register. This system requires considerably fewer electronic components and less complicated circuitry to achieve the generation of command pulses at a faster rate while reducing computer time.

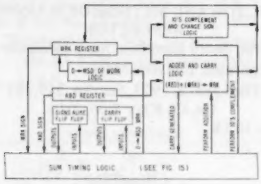
3,825,736
CALCULATOR WITH PROVISION FOR EFFICIENTLY MANIPULATING FACTORS AND TERMS

Thomas E. Osborne, San Francisco, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 826,306, May 21, 1969, abandoned, which is a division of Ser. No. 559,887, June 23, 1966, Pat. No. 3,566,160. This application Apr. 17, 1972, Ser. No. 244,994

Int. Cl. G06f *7/50, 7/52*

U.S. Cl. 235—168 **12 Claims**



A keyboard input language is employed that enables the operator to combine numerical factors into algebraic terms in which multiply and divide operators appear in their normal algebraic context and to form algebraic sums of these terms by postfixing add and subtract operators. The algebraic sum of an algebraic number (representing an algebraic term) contained in a first register and of another algebraic number (representing another algebraic term) contained in a second register is formed by employing an adder for adding the number portions of the algebraic numbers contained in the first and second registers when the sign portions of these algebraic numbers are alike and by employing a circuit for complementing the sign and number portions of the algebraic number contained in the first register when the sign portions of the algebraic numbers contained in the first and second registers are different, employing an adder for thereafter adding the number portions of the algebraic numbers contained in the first and second registers, and employing a circuit for treating the sign and the sum of the number portions of these algebraic numbers without the most significant digit of the sum as the algebraic sum when the algebraic number contained in the first register has been complemented and the most significant digit of the sum is an overflow and for complementing the sign and the sum of the number portions of these algebraic numbers to get the algebraic sum when the algebraic number contained in the first register has been complemented and the most significant digit of the sum is not an overflow.

3,825,737
DIGITAL PHASE DETECTOR

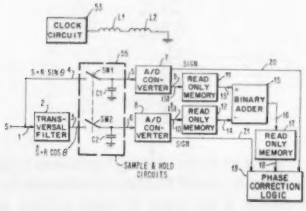
Alain Croisier, Cagnes, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 11, 1972, Ser. No. 313,893

Claims priority, application France, Dec. 21, 1971, 7147850

Int. Cl. G06f *15/34*

U.S. Cl. 235—186 **4 Claims**



A detector in which the phase θ of an applied sinusoid $S = R \sin \theta$ is digitally obtained by determining the unit circle equivalent of the quadrant of the phase angle from the sign match or mismatch between the sinusoid S and its quadrature $S = \overline{R} \cos \theta$ and by determining the unit circle equivalent of an acute reference angle α derived according to the relation $\alpha = \tan^{-1} e^{\ln |S| - \ln |\overline{S}|}$. The signal and its quadrature are periodically sampled and digitally sign and magnitude encoded. The digital magnitudes $|S|$ and $|\overline{S}|$ are applied to table look-up devices to obtain $\ln |S|$ and $\ln |\overline{S}|$ respectively. A digital subtractor forms $\ln |S| - \ln |\overline{S}|$, which difference is then applied to a table look-up device to obtain α. A logic element responsive to the encoded signs and the derived reference angle α generates the coded equivalent to θ.

3,825,738
APPARATUS FOR GENERATING TWO AMPLITUDE-STABILIZED VOLTAGES

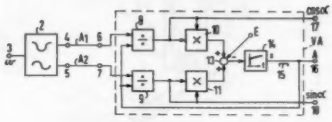
Felix Blaschke, and Lothar Schleicher, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munchen, Germany

Filed Sept. 7, 1972, Ser. No. 286,924

Claims priority, application Germany, Sept. 9, 1971, 2145134

Int. Cl. G06g *7/22*

U.S. Cl. 235—197 **3 Claims**



An apparatus for generating two amplitude-stabilized sinusoidal alternating-current voltages is disclosed. The apparatus includes a two-phase generator which is connected in cascade ahead of a vector analyzer. The output voltages of the two-phase generator are made to follow the output voltages of the vector analyzer with a control quantity which depends linearly on the difference between these voltages. The apparatus of the invention improves amplitude stabilization for the two-phase generator and accelerates the start-up thereof.

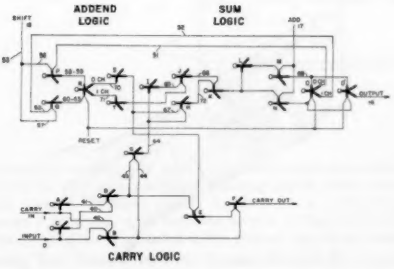
3,825,739
HIGH SPEED FLUIDIC DEVICES

Edward F. Richards, and Warren B. Depperman, both of Winterpark, Fla., assignors to Martin-Marietta Corporation, New York, N.Y.

Division of Ser. No. 546,935, May 2, 1966, Pat. No. 3,550,604. This application Sept. 16, 1970, Ser. No. 72,902

Int. Cl. G06d *1/10*

U.S. Cl. 235—201 PF **7 Claims**



This invention relates to a binary accumulator stage consisting of pure fluid bistable and OR-NOR elements. The stage is

joined with other similar stages to form a binary accumulator. Each stage sums an input value, a carry-in value supplied by a previous stage, and an addend value present in the addend register. An output signal and a carry-out signal are generated by each stage, the carry-out signal being fed to the succeeding stage as a carry-in signal.

3,825,740

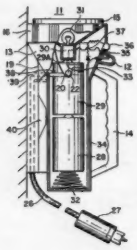
RECHARGEABLE FLASHLIGHT AND SUPPORT STAND THEREFOR

Abraham Friedman, and Aaron G. Friedman, both of 2444 Forest Green Rd., Baltimore, Md. 21209

Continuation-in-part of Ser. No. 291,518, Sept. 22, 1972, Pat. No. 3,749,905. This application May 7, 1973, Ser. No. 357,747The portion of the term of this patent subsequent to July 31, 1990, has been disclaimed.

Int. Cl. F21l *7/00*; **H02j** *7/00*

U.S. Cl. 240—10.6 CH **17 Claims**



A portable flashlight having rechargeable batteries and a support stand for attachment to a motor vehicle is provided. The flashlight defines a pair of contact electrodes mounted on the exterior of the flashlight casing which engage the stand and provide support for the flashlight and electrical contact for recharging the flashlight. Charging means is provided to match the voltage of the motor vehicle battery to the voltage of the rechargeable battery and preferably a light emitting diode is used to indicate the flow of current to said rechargeable battery. It is also preferred to provide means to protect the rechargeable battery from reverse charging.

3,825,741

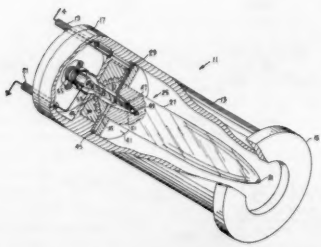
LIGHT SOURCE WITH HIGH EFFICIENCY LIGHT COLLECTION MEANS

Harvey L. Morton, Lafayette, and Bradley H. Oland, Oakland, both of Calif., assignors to Tinsley Laboratories, Inc., Berkeley, Calif.

Filed Mar. 5, 1973, Ser. No. 338,376

Int. Cl. F21m *7/00*

U.S. Cl. 240—41 R **14 Claims**



A light collector which completely surrounds an extended source, such as an arc tube, with a forward and rearward collector structure. The forward structure is an internally reflecting parabolic collector terminating in a narrow output aperture, while the rearward structure has two parts: a conical member with a rearwardly facing apex and a reflector member concavely behind the conical member. Both forward and rearward collector structures include axial pockets or apertures for receiving the extended source whose light rays are gathered and imaged through the output aperture.

3,825,742

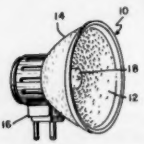
LAMP UNIT WITH CONTROLLED-DIFFUSION REFLECTOR AND METHOD OF MAKING THE REFLECTOR

Robert E. Levin, South Hamilton, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Jan. 2, 1973, Ser. No. 319,321

Int. Cl. F21v *7/06, 7/10*

U.S. Cl. 240—103 R **12 Claims**



For a lamp unit, a sagged glass reflector having a stippled, concave surface for providing controlled diffusion of light. The method of making the reflector comprises: providing a preheated concave mold having a uniform pattern of peened indentations in its surface and a plurality of vacuum drawing holes; placing a flat blank of glass across the opening of the mold; heating the glass to a plastic state; drawing a partial vacuum in the mold to force the plasticized glass to sag against the peened surface of the mold; cooling the glass to a rigid state; and applying a coating of reflective material on the concave surface of the sag-molded glass.

3,825,743

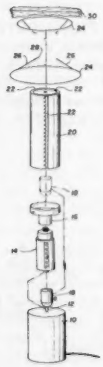
MULTI-CHANGEABLE LAMPSHADE

Frank E. C. Riley, Montreal, Quebec, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Oct. 19, 1973, Ser. No. 408,193

Int. Cl. F21v *1/08*

U.S. Cl. 240—144 **4 Claims**



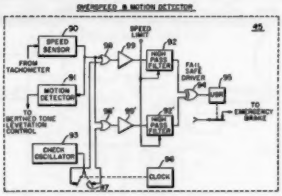
A lamp shade structure comprising an elongated hollow translucent cylinder open at both ends, the cylinder having

parallel spaced notched tracks extending in the axial direction along the outer surface; a lamp shade; and means extending inward from the shade and engaging said tracks to support the cylinder within the shade.

3,825,744
OVERSPEED DETECTOR FOR VEHICLE CONTROL SYSTEM

Henry C. Sibley, Adams Basin; John H. Auer, Jr., Fairport, and Willis R. Smith, Rochester, all of N.Y., assignors to General Signal Corporation, Rochester, N.Y.

Division of Ser. No. 152,845, June 14, 1971, Pat. No. 3,748,466. This application Mar. 26, 1973, Ser. No. 344,681
Int. Cl. B60l *15/00*; G08b *21/00*
U.S. Cl. 246—182 C **3 Claims**

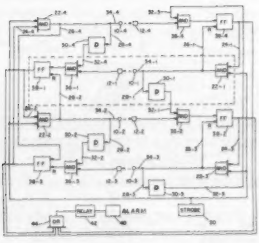


The Overspeed Detector for Vehicle Control Systems comprises a pair of high pass filters, having inputs governed by the actual vehicle speed signal, which deliver outputs only provided that the frequency of the inputs is above the frequency for the high pass filters, and the checking means includes an oscillator which generates a check signal with a frequency higher than the frequency of the high pass filters. The switching means alternately applies the check frequency to the inputs of the filters so that the filters alternately deliver output check frequency signals. Control means is governed jointly by outputs of the high pass filters and is operable to one state only when one of the filters at a time is delivering an output and operable to the other state when both filters deliver outputs contemporaneously.

3,825,745
OBJECT DETECTING SYSTEM

E. Craig Thomson, Wellesley, Mass., assignor to Electronics Corporation of America, Cambridge, Mass.

Filed May 21, 1973, Ser. No. 362,113
Int. Cl. G06m *7/00*; G08b *13/00*
U.S. Cl. 250—208 **24 Claims**

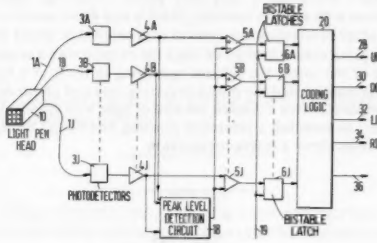


An object detecting system in which an area is monitored by a series of sequentially operated sensor channels which form a step-wise moving beam to trace out a curtain of radiation across the area, each channel including a radiation transmitter and a corresponding radiation sensor. The transmitter of each channel is permitted to receive an energizing pulse only if an output has been produced by the preceding channel; a pulse from a sensor is permitted to produce a channel output only if the transmitter of the preceding channel has received an energizing pulse. The system may be locked out if the radiation path between the transmitter and sensor of a channel is blocked by an object during operation of the channel.

3,825,746
LIGHT PEN

Hayden Brian Kendler, Ilford; Lionel George Ripley, and David John Woollons, both of Lewes, all of England, assignors to National Research Development Corporation, London, England

Filed Apr. 19, 1973, Ser. No. 352,692
Claims priority, application Great Britain, Apr. 27, 1972, 19582/72
Int. Cl. G02b *5/14*; G08b *23/00*
U.S. Cl. 250—209 **6 Claims**

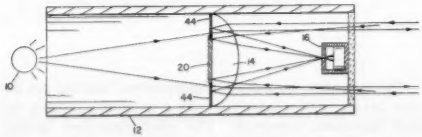


A light pen for interactive computer graphics consists of an array of, for example, nine photo-electric sensors. Associated logic compares the signals from the various sensors with a common reference signal in order to generate command signals to move a spot of light incident on the array so that it is aligned with the centre of the array.

3,825,747
SCANNER

E. Craig Thomson, 55 Livingston Rd., Wellesley, Mass. 02181

Filed May 21, 1973, Ser. No. 362,117
Int. Cl. H01j *3/14*
U.S. Cl. 250—216 **10 Claims**



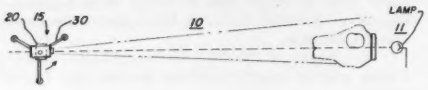
Scanning apparatus in which a sensor is mounted within a transceiver casing and a single focusing means both forms a beam from a radiation source for delivery to a target and focuses a returned beam onto the sensor. A forward looking reflective surface is included in the path of one of the beams, causing that beam to be twice passed through the focusing means. The sensor faces the radiation source, thus avoiding the need for a separate lens for the returned radiation. The scanner is particularly useful in detecting retro-reflective targets.

3,825,748

CAMERA AIMING STRUCTURE

Henri Van Wandelen, San Carlos, Calif., assignor to Photo-Control Corporation, Minneapolis, Minn.

Filed Sept. 24, 1973, Ser. No. 399,928
Int. Cl. G01j *1/20*
U.S. Cl. 250—221 **16 Claims**



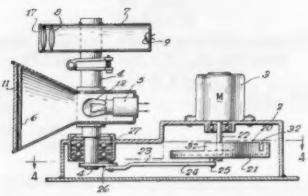
The camera aiming structure in which a camera has associated therewith a lens and photo detecting apparatus together with a motor control circuitry and drive motor or motors adapted to orient the camera on a support or about one or more pivot axes to realign or align the camera with a subject in front of the same, the subject appearing in front of a lighted background so that the photo detecting lens and photo detecting apparatus sees a desired amount of light with respect to the subject to establish a reference position and detect change of the subject from a reference position.

3,825,749

PHOTOELECTRIC PINFALL DETECTION SYSTEM

Michael G. Gautraud; Anthony J. Gretzky; Ivan Zachev; Richard D. Dunn, and Richard Szymanski, all of Muskegon, Mich., assignors to Brunswick Corporation, Skokie, Ill.

Filed June 5, 1972, Ser. No. 259,614
Int. Cl. H01j *39/12*
U.S. Cl. 250—222 R **23 Claims**



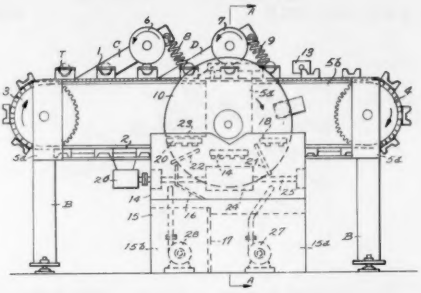
The invention includes a photoelectric bowling pin detection device and its interface with a computer scoring device and automatic pinsetter. The photodetection device or scanner includes a light source and a photosensitive element mounted for simultaneous sweep across the pin deck of the lane and a drive motor. Sensing action of the scanner and transmission of pinfall data to the computer is controlled by optical sensors mechanically gated by a rotating cylindrical mask attached to the scanner drive motor. The scanner is activated by passage of a delivered ball past a ball detector which causes the count to commence immediately upon ball passage and prior to initiation of the pinsetter cyclce. Two scanners may be used and their counts compared for accuracy. In the event that all pins are down, the pinsetter is signaled to set new pins without the customary delay or detection cycle.

3,825,750

METHOD AND APPARATUS FOR DETECTING DEFECTIVE SEALS ON BAG-SHAPED ARTICLES

Masao Hayase, Nagoya; Yoshiyuki Hayasaka, Tsushima, and Yozo Araki, Nagoya, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki, Tokyo, Japan

Filed Dec. 15, 1972, Ser. No. 315,509
Claims priority, application Japan, Dec. 21, 1971, 46-120128
Int. Cl. C10g *13/00*
U.S. Cl. 250—223 R **7 Claims**



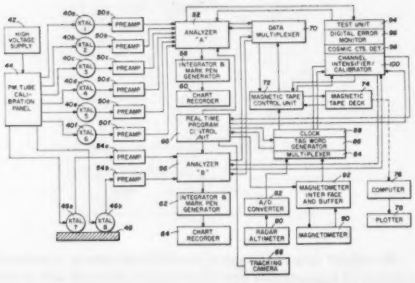
Method and apparatus capable of not only automatically detecting seals on bag-shaped articles that are defective, but also automatically ejecting the defectively sealed bags as they move along a conveyor.

3,825,751

METHOD AND APPARATUS FOR AERIAL RADIOACTIVITY SURVEYING FOR SURFACE MINERAL DEPOSITS WHICH COMPENSATES FOR THE RADIOACTIVE DECAY PRODUCTS IN THE ATMOSPHERE OF THE EARTH

Claiborne H. Johnson, Jr., and Robert S. Foote, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 3, 1969, Ser. No. 13,917
Int. Cl. G01v *5/00*
U.S. Cl. 250—253 **12 Claims**



An airborne gamma ray detection system is flown over the surface of the earth at a predetermined height. The energy

spectrum of gamma radiation from the surface of the earth is detected and recorded at locations spaced along the travel path of the system. The gamma radiation emanating from uranium decay products borne by the atmosphere of the earth is also sensed and recorded with sufficient regularity to detect naturally occurring variations therein. The gamma radiation data detected from the surface of the earth is then corrected in order to reduce the inaccuracies created by the gamma radiation sources present in the atmosphere.

3,825,752

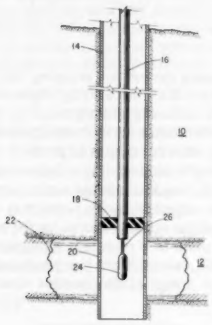
LOG-INJECTED-LOG SYSTEM

Robert P. Murphy, and H. Robert Froning, both of Tulsa, Okla., assignors to Amoco Production Company, Tulsa, Okla.

Continuation of Ser. No. 212,689, Dec. 27, 1971, abandoned. This application Aug. 9, 1973, Ser. No. 387,091

Int. Cl. G01t 1/00

U.S. Cl. 250—258 **5 Claims**



This invention relates to determining the oil saturation in the underground rock reservoir by use of a log-inject-log technique. The formation rock adjacent the well bore is prepared such that the saturation conditions there are representative of those in the interwell area. A thermal decay time log is then run. A chlorinated hydrocarbon oil mixture or blend miscible with the formation oil and having a chlorine content about the same as the formation water is used to displace all the formation oil from adjacent the well bore. A second thermal neutron decay time log is then run. These two logs are then used to determine reservoir characteristics.

3,825,753

METHOD FOR PROVIDING A NATURAL GAMMA-RAY LAG IN CONJUNCTION WITH ASSAY OPERATIONS WITHIN A BOREHOLE

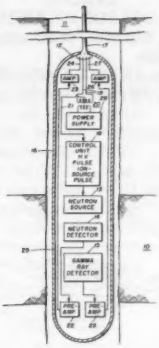
Wyatt W. Givens, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 6, 1972, Ser. No. 295,647

Int. Cl. G01v 5/00

U.S. Cl. 250—265 **3 Claims**

A borehole logging tool is utilized to assay the formations surrounding the borehole by operating a pulsed neutron source to irradiate the formations with bursts of neutrons. A neutron detector monitors the delayed neutrons produced by the formations upon irradiation by the neutrons, and a gamma-ray detector monitors the delayed gamma rays produced by the formations upon irradiation by the source neutrons. The gamma-ray detector is also operated between



assay operations to detect the natural gamma radiation of the formations being assayed.

3,825,754

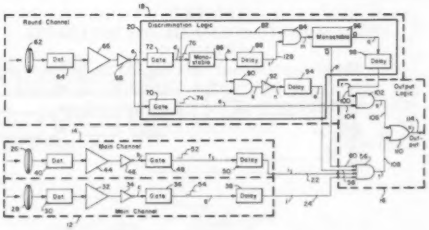
DUAL SPECTRUM INFRARED FIRE DETECTION SYSTEM WITH HIGH ENERGY AMMUNITION ROUND DISCRIMINATION

Robert J. Cinzori, and Gerald F. Stapleton, both of Santa Barbara, Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed July 23, 1973, Ser. No. 381,814

Int. Cl. G01t 1/16

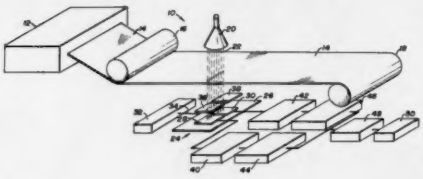
U.S. Cl. 250—338 **14 Claims**



Disclosed is a multichannel fire or explosion detection system wherein an output fire suppression or control signal is generated in response to fires or explosions which radiate power above a predetermined threshold level. The system includes means which discriminate against explosive fires in a fuel tank or other highly combustible material on the one hand and high energy exploding rounds of ammunition per se which do not subsequently cause a large scale fire. Thus, the present detection system will not generate an output fire suppression or control signal in the event a high energy ammunition round explodes in the vicinity of a fuel tank without igniting and exploding it. Additionally, fail safe detection logic means are provided in the present system and generate a time delayed fire suppression enable signal to thereby enable an output

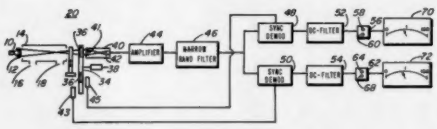
signal gate in the event of a delayed or secondary fire or explosion above a predetermined magnitude.

3,825,755
GAUGE FOR POLYMERS
Wallace R. Ruskin, Blacklick, Ohio, assignor to Infra-Data, Inc., Columbus, Ohio
Filed Nov. 13, 1972, Ser. No. 305,990
Int. Cl. G01t 1/16
U.S. Cl. 250—339 **8 Claims**



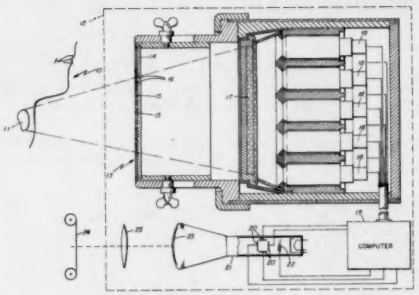
A gauge for measuring the thickness of plastic film including an infrared radiation source transmitting light through or reflecting it from the film to reference and absorption photoconductive detectors. A signal generator is operatively connected to the detectors and causes modulation of the electrical signals emanating therefrom. Amplifiers and filters act on the signals and a comparator receives the signals from the reference and absorption detectors and gives an indication of the thickness of the film.

3,825,756
CALIBRATION DEVICE FOR A GAS ANALYZER
Morris Weiss, Pelham, N.Y., assignor to Barnes Engineering Company, Stamford, Conn.
Filed May 3, 1973, Ser. No. 356,876
Int. Cl. G01n 21/26
U.S. Cl. 250—343 **3 Claims**



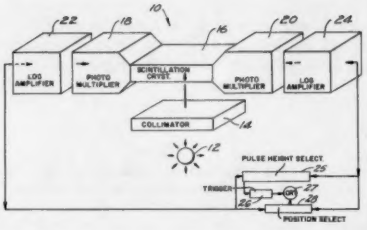
A calibration device is provided for a gas analyzer which measures the amounts of a plurality of gases in a gas sample. A source of radiation is applied through a gas sample, and selectively applied to an infrared detector by a filter wheel which alternately applies radiation from an absorption region of the gas to be measured and from a transparent or reference wavelength. Filters for different absorption regions are used with the reference filter to detect the presence of different gases in the sample. A calibration device is inserted between the source and the infrared detector which attenuates radiation in the desired absorption regions while passing radiation in the reference region. The calibration device is comprised of a suitable infrared transmissive substrate, such as germanium, with different anti-reflective coatings on each side of the element to achieve the necessary attenuation for the measured wavelengths while passing radiation in the reference wavelength.

3,825,757
NUCLEAR IMAGING SYSTEM
Harrison H. Barrett, Lexington, and Frank A. Horrigan, Waltham, both of Mass., assignors to Raytheon Company, Lexington, Mass.
Continuation of Ser. No. 194,382, Nov. 1, 1971, abandoned.
This application May 14, 1973, Ser. No. 360,223
Int. Cl. G01n 21/34
U.S. Cl. 250—363 **20 Claims**



A nuclear imaging system for mapping the source of high energy nuclear particles from a living organ which has selectively absorbed a radioactive compound by spatially coding the energy from the source in a Fresnel pattern on a detector and decoding the detector output to produce an image of the source. The coding is produced by a Fresnel zone plate interposed between the nuclear energy source and the detector whose position is adjustable with respect to the detector to focus the slices of the nuclear source on the detector. By adjusting the zone plate to a plurality of positions, data from a plurality of cross-sectional slices are produced from which a three-dimensional image of the nuclear source may be obtained.

3,825,758
SCINTILLATION CRYSTAL
Floro D. Miraldi, 2660 Edgehill Rd., Cleveland Heights, Ohio 44106
Continuation of Ser. No. 179,749, Sept. 13, 1971, abandoned.
This application Apr. 9, 1973, Ser. No. 349,022
Int. Cl. G01t 1/20
U.S. Cl. 250—366 **4 Claims**

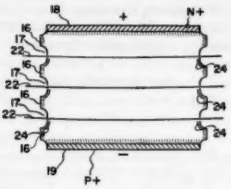


A plurality of elongated scintillation crystals combined in a unit. The scintillation crystals may be either parallel bars or concentric tubular members. In either event separators such as aluminum foil may be used to prohibit signals from crossing between scintillation crystals. Magnesium oxide holds the individual scintillation crystals together as a unit and acts as a highly reflective material to enhance the transmission of the signals.

3,825,759
GAMMA RAY DETECTOR WITH CHANNEL LIMITING MEANS

Robert N. Hall, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 24, 1972, Ser. No. 299,922
Int. Cl. G01t 1/24
U.S. Cl. 250—370 12 Claims

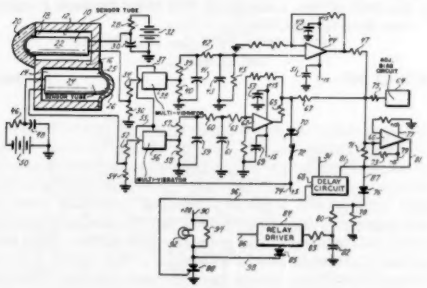


High purity germanium gamma ray detectors are provided with at least one, and preferably a plurality, of lateral channel-limiting regions which prevent the short-circuiting of a substantial portion of the lateral surface of the detectors by spurious channels of conductivity-type opposite to that of the residual conductivity-type of the germanium.

3,825,760
FLAME DETECTOR OPERABLE IN PRESENCE OF PROTON RADIATION

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of, Washington, D.C.; Dayton J. Walker; John E. Turnage; Rodney M. F. Linford, both of Bridgeton, and Steve D. Cornish, St. Louis, all of Mo.

Filed Mar. 21, 1973, Ser. No. 343,308
Int. Cl. G01t 1/16
U.S. Cl. 250—372 8 Claims

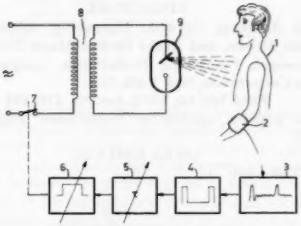


A detector of ultraviolet radiation for operation in a space vehicle which orbits through high-intensity radiation areas. Two essentially identical ultraviolet sensor tubes are mounted within a shield which limits, to acceptable levels, the amount of proton radiation reaching the sensor tubes. The shield has an opening which permits ultraviolet radiation to reach one of the sensor tubes, hereafter referred to the sensing tube. However, the shield keeps ultraviolet radiation from reaching the other sensor tube, hereafter referred to as the reference tube. Both sensor tubes receive approximately the same amount of proton radiation, but the sensing tube also is able to receive ultraviolet radiation. The circuitry of the detector subtracts the output of the reference tube from the output of the sensing tube. Therefore, any portion of the output of the sensing tube which is due to proton radiation is offset by the output of the reference tube. Consequently, the output of the circuitry of the detector is proportional to the amount of ultraviolet radiation reaching the sensing tube. A delay circuit in the detector prevents false alarms by keeping statistical variations in the proton radiation sensed by the two sensor tubes from developing an output signal.

3,825,761
X-RAY APPARATUS FOR DISPLAYING IN SLOW MOTION TISSUES WHICH MOVE WITH THE RHYTHM OF THE HEART

Edmund Geratsdorfer, Munich, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 281,117, Aug. 16, 1972, abandoned, which is a continuation of Ser. No. 93,089, Nov. 27, 1970, abandoned. This application July 5, 1973, Ser. No. 376,364
Claims priority, application Germany, Dec. 17, 1969, 1963312
Int. Cl. H05g 1/00
U.S. Cl. 250—402 2 Claims

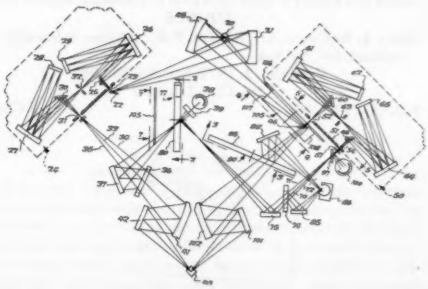


A method of X-ray examination of objects that move in rhythm with the heart wherein the image information is switched on and off in synchronism with the heart action. In a preferred embodiment, the high voltage supply of the X-ray tube is switched on and off at the heart frequency and is on for a period that is short compared with the duration of one heart action.

3,825,762
APPARATUS FOR MEASURING LUMINESCENT RADIATION

John U. White, 80 Lincoln Ave., Darien, Conn. 06902

Continuation-in-part of Ser. No. 277,390, Aug. 2, 1972. This application Dec. 5, 1972, Ser. No. 312,295
Int. Cl. G01n 21/52
U.S. Cl. 250—458 30 Claims



A luminescence spectrophotometer having an excitation monochromator and a dual channel emission monochromator

which receives light through one channel to form a monochromatic calibration beam. The beam is then split into two parts. One part is directed to a first detector having known wavelength response characteristics, and the second part is sent back through the other monochromator channel to a second detector. The ratio of these detector outputs is measured to determine the relative transmission and sensitivity of the luminescence system at each wavelength. Monochromatic light from the excitation monochromator also is split into two parts, with one going to a sample of luminescent material and the other going to the first detector alternately with the first part of the calibration beam. The emitted light from the sample and the second part of the calibration beam are directed to opposite sides of a rotating chopper and then alternately through the second monochromator channel to the second detector. The readings from the two detectors are combined in an electrical circuit to obtain a ratio that is a function of the ratio of luminescent to excitation intensities and is independent of source brightness and detector sensitivity.

3,825,763

LUMINESCENT SCREEN HAVING A MOSAIC STRUCTURE

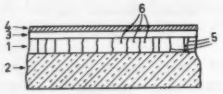
Martinus Adrianus Cornelis Ligtenberg; Albert Leendert Nicolaas Stevels, and Agnes Desiree Maria DePauw, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 10, 1972, Ser. No. 270,494

Claims priority, application Netherlands, July 10, 1971, 7109571

Int. Cl. G01t *1/20*

U.S. Cl. 250—486 **17 Claims**



In a luminescent layer which is composed of spatially separated areas for reduction of lateral light dispersion in the layer, this subdivision is realized by provision of a crack structure in the luminescent layer.

This crack structure is realized by thermal treatment of a layer which is provided on a substratum, and can be made optimum by an appropriate choice of the layer thickness, so that deposition in a plurality of sublayers can be advantageous. The crack structure can also be caused by a pattern which is provided in the substratum surface or by means of a gauze which serves as a substratum.

3,825,764

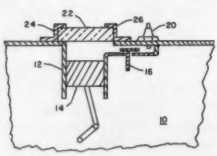
HIGH INTENSITY MODULATED INFRARED RADIATION SOURCE

Glenn A. Anderson, Sr., Nashua, N.H., assignor to Sanders Associates, Inc, Nashua

Filed Oct. 2, 1972, Ser. No. 293,989

Int. Cl. G21h *3/00*

U.S. Cl. 250—495 **5 Claims**



An internal combustion reciprocating engine having a highly transparent window replacing the head or a portion thereof provides a modulated infrared radiation source whereby the radiation from the combustion gases passing through the window is essentially fully modulated at varying frequencies.

3,825,765

PHOTOELECTRIC SURFACE SCANNING DEVICE

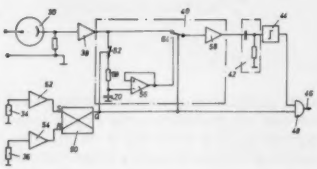
Helmut Schober, Taufkirchen, and Bernd Marquardt, Munich, both of Germany, assignors to Firma Erwin Sicke Optik-Electronik, Waldkirch, Germany

Filed Sept. 17, 1973, Ser. No. 397,813

Claims priority, application Germany, Sept. 14, 1972, 2245058

Int. Cl. G01n *21/38*

U.S. Cl. 250—563 **5 Claims**



The signal from the photoelectric detector is employed by an electronic flaw analyzer only during the time that the light beam is sweeping across the surface to be examined. That signal is cut off from the flaw analyzer during the times that the light beam passes beyond the edges of the surface being examined. During these periods of cutoff, the flaw analyzer is supplied with a stored signal which stored signal was formed by taking the mean of a previous signal from the photoelectric detector.

3,825,766

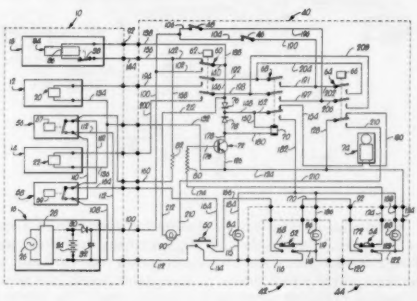
ELECTRICAL CONTROL APPARATUS

John S. Connor, Greenwood, and Robert E. Pugh, Grain Valley, both of Mo., assignors to Fike Metal Products Corporation, Blue Springs, Mo.

Filed July 11, 1973, Ser. No. 378,252

Int. Cl. B63j *2/06*

U.S. Cl. 307—9 **15 Claims**



Improved electrical control apparatus is provided for the correlated control of systems having some desired relationship of interdependence between the functional conditions and operational states of various electrically responsive parts thereof, such as systems including a selectively operable device requiring electrical energization for operation thereof and associated electrically actuatable equipment for suppressing an occurrence of a potential hazard to which opera-

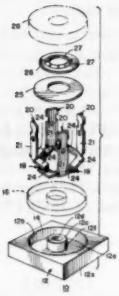
tion of the device may adversely contribute. The apparatus achieves correlated control of the device and equipment of such systems by providing for actuation of the suppression equipment whenever it is in functional condition and needed, ordinary selective operation of the device only when the equipment is in functional condition, presentation of a warning indication of conditions adversely affecting the ability of the equipment or its associated actuating controls to function, special override controlled operation of the device under exceptional circumstances when the equipment is known to be in a non-functional condition, and presentation of a warning indication when the special override control has been invoked. The preferred form of the apparatus also includes self-checking features for assuring its own functional integrity or indicating a fault therein. The apparatus is illustrated by an embodiment showing application of the invention to the correlated control of a system involving internal combustion engines and fire suppression equipment such as employed in inboard powered boats, from which example the applicability of the apparatus to other systems involving comparable considerations should be apparent.

3,825,767

RECTIFIER ASSEMBLY

Marvin L. Shields, Bloomington, Ind., assignor to Sarkes Tarzian Inc.,, Bloomington, Ind.

Filed Aug. 22, 1973, Ser. No. 390,337
Int. Cl. H02b 1/00
U.S. Cl. 307—100 **14 Claims**



A rectifier assembly comprising a base formed of heat conductive material and having a flat, annular mounting face encircling an integral upstanding centrally positioned mounting post, a layer of electrically insulating material on said mounting face; a rectifier assembly comprising one or more heat producing rectifier elements mounted on said base in symmetrical array around said mounting post including conductive terminal means for at least some of said elements including flat strip portions in direct heat conductive contact against said layer of insulating material and means mounted on said post for uniformly and continuously forcing each of said strip portions against said layer of insulating material for transmission of heat developed in said rectifier elements to said heat sink base.

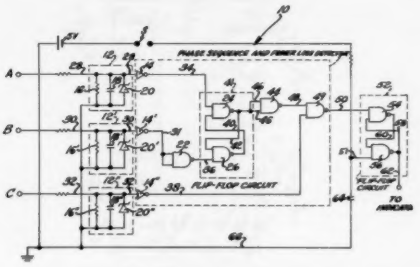
3,825,768

PHASE SEQUENCE AND POWER LOSS DETECTOR

James W. Grygera, Racine, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 15, 1973, Ser. No. 332,855
Int. Cl. H02h 1/00
U.S. Cl. 307—127 **13 Claims**

A phase sequence and power loss detector is provided to sense incorrect phase sequence or loss of power from a poly-phase power line. To this end predetermined individual connections are provided for each phase signal of the poly-phase power line. The individual signals are conditioned by signal conditioning circuits and then directed to the phase sequence and power loss circuit. The phase sequence and power loss circuit produces a pulsating output signal when the individual signals of the poly-phase power signal have an incorrect phase relationship, or fail to provide power. A constant level output signal is produced by the phase sequence and power loss circuit when the individual signals of the poly-phase power signal have a predetermined phase relationship and provide power to their respective connections. The output of the phase sequence and power loss circuit is connected to a flip-flop circuit which converts the pulsating and constant level output signals of the phase sequence and power loss circuit to distinct first and second constant level output signals for operating an indicator.

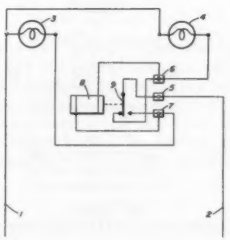


3,825,769

ALTERNATE LIGHT LIGHTING FIXTURE

Ricker Alford, Jr., 211 Murray Rd., West Palm Beach, Fla. 33405

Filed June 23, 1972, Ser. No. 241,803
Int. Cl. H02j 1/00
U.S. Cl. 307—157 **2 Claims**



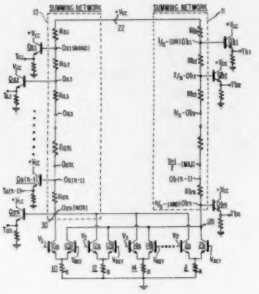
A primary lamp and a spare standby lamp are interconnected in parallel with a source of electrical energy through an automatic lamp changing device in order to provide illumination from the standby lamp should there be burn out of the primary lamp. Lamp change-over operation is effected by momentarily switching off the lamp energizing circuit following burn out of the primary lamp and involves a single relay device connected in series with the standby lamp to maintain the same energized in a circuit parallel to that of the primary lamp when operating.

3,825,770

MULTI-FUNCTION LOGIC GATE

Daniel Hampel, Westfield, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 10, 1972, Ser. No. 295,852
Int. Cl. H03k 19/08
U.S. Cl. 307—203 11 Claims



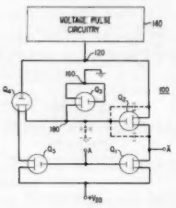
A pair of current carrying lines, and a plurality of signal controlled means, each such means supplying a current to one or the other of the current carrying lines depending upon the binary value represented by the signal controlling that signal controlled means. Connected to at least one of the current carrying lines is a summing network comprised of "N" resistors connected in series for simultaneously producing N different logic functions of the signals applied to said signal controlled means.

3,825,771

IGFET INVERTER CIRCUIT

Harry Joseph Boll, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Dec. 4, 1972, Ser. No. 311,482
Int. Cl. H03k 19/08
U.S. Cl. 307—214 13 Claims



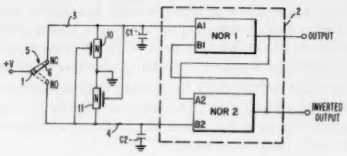
A semiconductor inverter circuit consists of a driver, a load, and two other IGFETs. One of the two IGFETs is wired as a diode that is connected to the gate of the load IGFET. The drain of the other IGFET is also connected to the gate of the load IGFET. The source and drain of the load and diver are connected together and serve as the output terminal of the circuit. The gate of the diver serves as the input terminal. The IGFET connected as a diode serves to hold the load on while the output signal drops from a high to a low state. This significantly decreases the time necessary to achieve this change of state as compared to the case in which the load turns off. The fourth IGFET serves to turn off the load when the output signal is to assume the high state.

3,825,772

CONTACT BOUNCE ELIMINATOR CIRCUIT WITH LOW STANDBY POWER

Richard Allan Ainsworth, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 25, 1973, Ser. No. 364,183
Int. Cl. H03k 3/286, 3/33, 19/08
U.S. Cl. 307—247 A 13 Claims



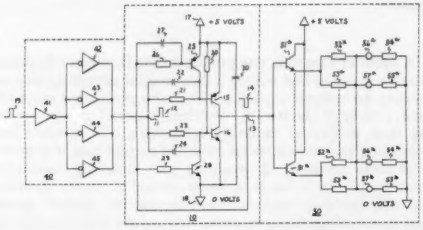
A contact bounce eliminator circuit including a pair of cross-coupled field effect transistors connected across the input leads of a flip-flop circuit for discharging an input when the potential source is switched from one input to the other. Energy in the circuit is dissipated only until circuit reaches a quiescent state, assuring low power dissipation when the mechanical contact is actuated. Virtually no power is dissipated in the quiescent state.

3,825,773

INTERLOCKED PUSH-PULL DRIVER CIRCUIT

Olev Kivistik, Waynesboro, Va., assignor to General Electric Company, West Lynn, Mass.

Filed May 4, 1973, Ser. No. 357,458
Int. Cl. H03k 17/00
U.S. Cl. 307—255 6 Claims



An improved driver circuit having push-pull output transistors for supplying current to a load, includes an interlock circuit for preventing the simultaneous conduction of the two output transistors. The base-emitter junction of each output transistor is connected to the collector-emitter circuit of an interlock transistor. The base current for each interlock transistor comes from the current conducted to or from the load. As long as the interlock transistor is conductive, the input signal is unable to provide sufficient base current to turn on its associated output transistor. When the conductive output transistor becomes non-conductive, thereby removing the base current drive to the conductive interlock transistor, the conductive interlock transistor becomes non-conductive and

allows the input voltage to supply base current to turn on the non-conductive output transistor.

3,825,774

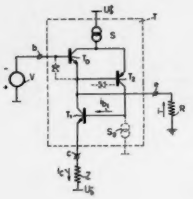
DEVICE FOR CONVERTING AN INPUT VOLTAGE INTO AN OUTPUT CURRENT OR VICE VERSA

Theodorus Jozef Van Kessel; Rudy Johan Van De Plassche, and Johannes Otto Voorman, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 17, 1972, Ser. No. 218,389

Claims priority, application Netherlands, Feb. 19, 1971, 7102199

U.S. Cl. 307—260 **15 Claims**



Device for the distortion-free conversion of a signal voltage into a signal current or vice versa which comprises an input transistor having two main electrodes. A high-resistance current supply source is included between the first main electrode and a supply point, while this main electrode is also connected via a current feedback path to the control electrode of a first transistor the main current path of which is connected in the circuit between the second main electrode of the input transistor and another supply point, the output of the device being a point of the latter circuit.

3,825,775

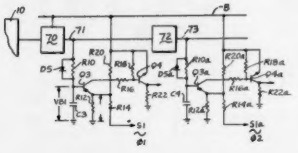
CIRCUIT ARRANGEMENT FOR CONVERTING SQUARE WAVES INTO ASYMMETRICAL RECTANGULAR WAVES

Alan B. Welsh, Jasper, Ind., assignor to Jasper Electronics Manufacturing Company, Jasper, Ind.

Continuation of Ser. No. 136,033, April 21, 1971, abandoned. This application May 15, 1973, Ser. No. 360,461

Int. Cl. H03k *5/01*

U.S. Cl. 307—268 **9 Claims**



The specification discloses a generator for producing rectangular waves in which the duty cycle of the waves is adjusted to eliminate unwanted harmonics therefrom. Means can be provided for varying the duty cycle in a desired manner.

3,825,776

SWITCHABLE CURRENT GENERATOR

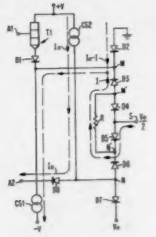
Christian A. Jacquart, Gattieres, France, assignor to IBM Corporation, Armonk, N.Y.

Filed Dec. 13, 1972, Ser. No. 314,866

Claims priority, application France, Dec. 21, 1971, 71.47851

Int. Cl. G05f *1/40, 3/00*

U.S. Cl. 307—270 **6 Claims**



A current generator comprising switchable circuit means for selectively establishing current loops for providing high stable null, and equal but opposite polarity currents dependent only on resistive means.

3,825,777

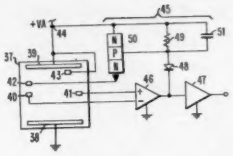
HALL CELL WITH OFFSET VOLTAGE CONTROL

Roland J. Braun, Vestal, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 14, 1973, Ser. No. 332,475

Int. Cl. H01l *19/00*

U.S. Cl. 307—309 **7 Claims**



Offset voltage control means are provided for a semiconductor type Hall cell. The control means includes one or more auxiliary electrodes disposed at preselected spatial positions of the cell between the latter's current and sense electrodes. The auxiliary electrode(s) when connected to a predetermined electrical supply provide an auxiliary electrical field which controls the offset voltage at the sense electrodes.

3,825,778

TEMPERATURE-SENSITIVE CONTROL CIRCUIT

Adel Abdel Aziz Ahmed, Annandale, N.J., assignor to RCA Corporation, New York, N.Y.

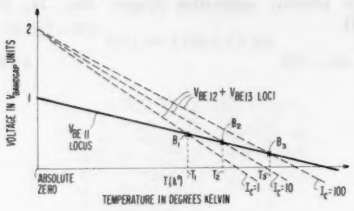
Filed Feb. 9, 1973, Ser. No. 331,234

Int. Cl. H03k *17/00*

U.S. Cl. 307—310 **21 Claims**

A temperature sensitive switching circuit includes a current source supplying two groups of serially connected diodes. The number of such diodes in the first group is smaller than that in the second so that the first group drawn substantially all of the source current and the second only an infinitesimal portion of this current. As temperature increases, the voltage across both groups of diodes decrease, but the ability of the second group to carry a substantial amount of current increases at a more

rapid rate than this decreased voltage would tend to reduce such current, and increases non-linearly with temperature above a given threshold temperature. This non-linear increase



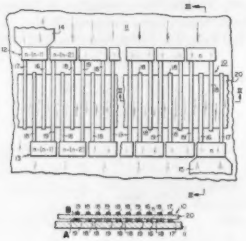
in current flow may be used to sense temperature change and also to control the power responsible, either directly or indirectly, for this temperature change.

3,825,779

INTERDIGITAL MOSAIC THIN FILM SHEAR TRANSDUCER

John deKlerk, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 30, 1973, Ser. No. 346,547
Int. Cl. H04r *17/00*
U.S. Cl. 310—9.8 **2 Claims**



An interdigital shear transducer which includes a substrate to which a first pair of first and second electrode arrays is deposited. Each array includes *n* metalized conductive pads and a pair of electrodes for each pad. Except for the first and last pads of the first and second arrays, respectively, one electrode of each pair is common to a corresponding but adjacent pad of an opposite array. The first and last pad electrodes are independent. All electrodes are interdigitated between electrodes of an opposite array. A piezoelectric film is deposited over the electrodes of the first pair and the substrate. A second pair of identical first and second arrays is deposited so as to have conductive pads in common with the first pair and electrodes deposited on the film over like electrodes of the first pair.

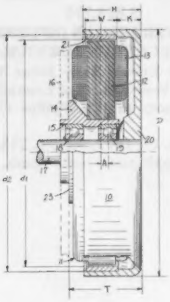
3,825,780

SYNCHRONOUS HYSTERESIS MOTOR

Preston R. Weaver, Rocky Hill, Conn., assignor to UMC Electronics Company, North Haven, Conn.

Continuation-in-part of Ser. No. 320,061, Jan. 2, 1973, abandoned. This application June 4, 1973, Ser. No. 366,467
Int. Cl. H02k *7/02*
U.S. Cl. 310—74 **2 Claims**

A synchronous hysteresis motor of the type including an internal stator and an overhung rotor having a hysteresis ring and rotatable with respect to the stator with a shaft rotatably mounted within the stator on two spaced apart bearing assemblies where the rear bearing assembly is spaced no more than



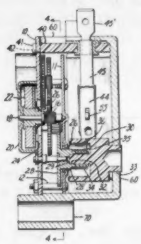
A = 0.225 H from the diametrical center of the hysteresis ring where H is the axial dimension of the rotor, and the ratio of the inside diameter of the ring to the outside diameter is at least 0.875.

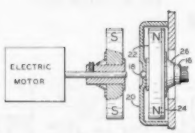
3,825,781

MAGNETICALLY DRIVEN TIMER

Lee O. Woods, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Jan. 15, 1973, Ser. No. 323,729
Int. Cl. H02k *5/16*; **H01h** *7/00*
U.S. Cl. 310—90 **2 Claims**



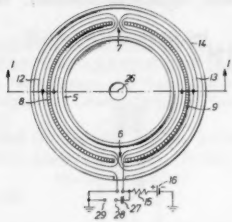


A magnetically driven timer is disclosed comprising electric switch means, a generally disc shaped rotatable magnetic follower, and means for dampening hunting action by the magnetic follower when rotatably driven by extrinsic magnetic drive means. Rotational speed reduction means are coupled with the magnetic follower. Switch actuation means are coupled with the rotational speed reduction means for actuating the switch means.

3,825,782
INDUCTIVE GENERATOR

Alfred Dassler, Konstanz, Germany, assignor to Licentia Patent Verwaltungs-G.m.b.H., Frankfurt, Germany

Filed Dec. 29, 1972, Ser. No. 319,800
Int. Cl. H02k 19/20
U.S. Cl. 310—168 12 Claims

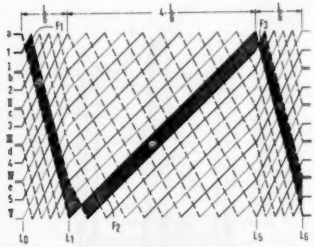


An inductive, frequency generator having first teeth-like protrusions provided in at least one of two first annular regions of a magnetically excited stator one of the first annular regions being divided into at least two arcuate portions. Further substantially identically shaped teeth-like protrusions are provided in at least one of two further annular regions of a rotor. The rotor and stator are positioned close to one another with their respective annular regions and teeth-like protrusions opposed to define two air gaps and constitute at least two distinct magnetic circuits. First and second partial windings are respectively positioned about portions of the respective magnetic circuits and are connected for additively summing induced useful voltages produced by magnetic flux changes resulting from rotation of the rotor. The magnetic circuits are excited by steady magnetic fields oppositely directed with respect to the orientations of the partial windings. Voltages produced by interfering magnetic fields are substantially reduced or cancelled, while the useful voltages are additively summed.

3,825,783
CONDUCTOR BAR FOR ELECTRICAL MACHINES

Heinrich Duffert, Mulheim/Ruhr, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Aug. 30, 1972, Ser. No. 284,866
Claims priority, application Germany, Sept. 3, 1971, 2144131
Int. Cl. H02k 3/14
U.S. Cl. 310—213 1 Claim

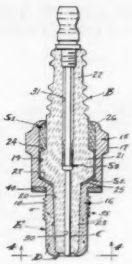


Conductor bar for insertion into a core notch of an electrical machine, includes partial conductors disposed in three longitudinally extending planes, the partial conductors being twisted together, and, to compensate for radial and tangential stray fields at overhanging end portions of the bars as well as for core notch transverse field, the number of partial conductors for each of the planes being uneven, the partial conductors of the outer planes having a twist of 90° over an initial sixth of the length thereof, a twist of 180° over the succeeding second to fifth sixths thereof and a twist of 90° over the sixth sixth thereof, and being alternatingly stranded together in the middle plane, and the partial conductors of the inner plane in the initial sixth, the second to fifth sixth and the sixth sixth of the length thereof having a doubled twist of 180°, 360° and 180°, respectively.

3,825,784
BODY CONTROLLED HEAT RANGE AND EXTENDED GAP SPARK PLUG

Maurice E. Lindsay, 700 E. Holly St., No. 7, Los Angeles, Calif. 90145

Filed Sept. 25, 1972, Ser. No. 291,975
Int. Cl. H01t 13/16
U.S. Cl. 313—11.5 20 Claims

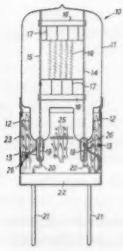


A spark plug for internal combustion engines wherein heat range is controlled by body configuration and the dissipation of heat through an extended nose portion of the body that extends beyond the "reach" to protectively enclose an extended insulator and center electrode, and that is exposed within the combustion chamber with the spark gap positioned at the "eye" of combustion and/or at an optimum ignition point. The heat range of the spark plug is efficiently controlled by means of the exposure and the fineness ratio of the extended nose portion of the spark plug body and heat transferred therefrom through threaded engagement that is of assured tightness adjacent the combustion chamber.

3,825,785
LAMP CAP CONSTRUCTION

Kenneth Buckley Robinson, London, England, assignor to Thorn Electrical Industries Limited, London, England

Filed Apr. 4, 1973, Ser. No. 347,773
Claims priority, application Great Britain, May 3, 1972, 20671/72
Int. Cl. H01l 61/52
U.S. Cl. 313—43 10 Claims



A high-temperature lamp having seals which may be prone to failure as a result of oxidation at elevated temperatures has

a lamp cap with a sleeve fashioned from expanded metal which surrounds the seal regions, the expanded metal promoting heat dissipation from the seal regions, primarily by radiation and convection, so as to keep the seals below temperatures at which oxidation is a problem.

3,825,786

METHOD FOR INCREASING THE POWER X-RAY TUBES AND APPARATUS FOR CARRYING OUT THE METHOD

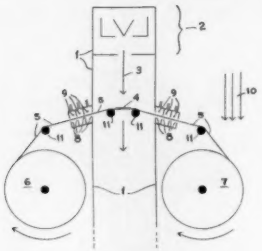
Hans J. Einighammer, Hausserstr. 140, 76 Tubingen, and Rudolf Hauke, Balthesan, Neumann-Str. 37, 7 Stuttgart 40, both of Germany

Filed Jan. 17, 1973, Ser. No. 324,388

Claims priority, application Germany, Feb. 2, 1972, 2204773

Int. Cl. H01j *35/08*

U.S. Cl. 313—60 **10 Claims**



A method for increasing the electron beam density and power of X-ray tubes, and a novel X-ray tube construction, wherein the target is in the form of an elongated member of target material, such as a strip, tape or filament, which is mechanically moved across the path of the electron beam to continuously present cold target material to the beam and remove heated target material from the electron beam path for cooling at a location spaced therefrom.

3,825,787

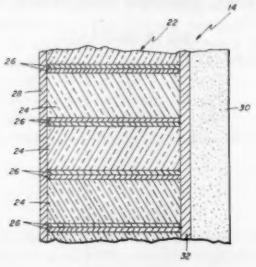
IMAGE INTENSIFIER WITH IMPROVED INPUT SCREEN

Howard D. Doolittle, Stamford, Conn., assignor to The Machlett Laboratories, Incorporated, Springdale, Conn.

Continuation-in-part of Ser. No. 76,851, Sept. 30, 1970, abandoned. This application Aug. 14, 1972, Ser. No. 280,614

Int. Cl. H01j *29/18*

U.S. Cl. 313—102 **27 Claims**



An image intensifier tube having a novel input screen structure comprising a photocathode used in conjunction with a novel radiation-sensitive structure for increasing efficiency in the conversion of X-rays, gamma rays or neutrons to light and subsequently to electrons.

3,825,788

HIGH PRESSURE METAL VAPOR DISCHARGE LAMP WITH TUBULAR CURRENT LEAD INCLUDING FILLER RELEASE CONSTRUCTION

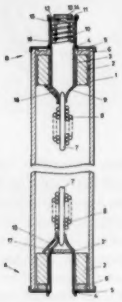
Johannes Pfaue, and Jochen Schmidt, both of Berlin, Germany, assignors to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH, Munich, Germany

Filed Feb. 27, 1973, Ser. No. 336,368

Claims priority, application Germany, Mar. 1, 1972, 2209805

Int. Cl. H01j *61/22, 61/28*

U.S. Cl. 313—174 **12 Claims**



The high pressure metal vapor discharge lamp, preferably a high pressure sodium vapor discharge lamp has an arc tube of refractory light-transmissive material such as polycrystalline alumina; it has at least one tubular lead hermetically sealed to the seals of the arc tube end portions formed with an enlarged section hermetically closed off from the exterior. The enlarged section contains the metal provided as the fill substance and a body with capillary interstices, such as a helical winding, tungsten, wool, or the like. The other end of the lead is in communication with the arc tube. The lead permits use of larger amounts of filling metal and provides dosed supply thereof to the discharge.

3,825,789

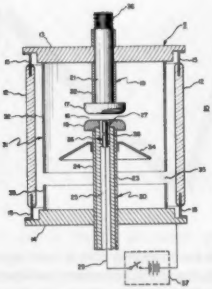
VACUUM ARC DEVICES WITH HARD, DUCTILE, FERROUS ELECTRODES

Lawson P. Harris, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed June 29, 1973, Ser. No. 375,133The portion of the term of this patent subsequent to Oct. 30, 1990, has been disclaimed.

Int. Cl. H01h *1/02*; **H01j** *1/02*

U.S. Cl. 200—144 B **14 Claims**



Vacuum arc devices utilized to protect electric circuit elements against very high transient currents and voltages and exhibiting high recovery voltage and high voltage holdoff

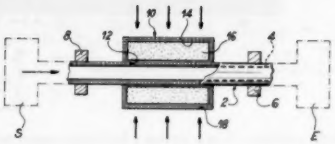
strength include primary arc electrodes fabricated from hardenable ferrous material exhibiting high hardness, ductility, and high tensile strength. Such vacuum arc devices are superior to similar devices utilizing copper or cuprous alloy electrode materials because of increased mechanical strength and increased voltage holdoff strength and higher current interruption capacity.

3,825,790

PROCESS FOR EXCHANGE OF CHARGE AND APPARATUS FOR CARRYING OUT THE PROCESS

Martha Bacal, Paris, France, and Walter Reichelt, Los Alamos, N. Mex., assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Oct. 16, 1972, Ser. No. 297,660
Claims priority, application France, Oct. 19, 1971, 37448
Int. Cl. H01j *27/00*
U.S. Cl. 313—362 **6 Claims**



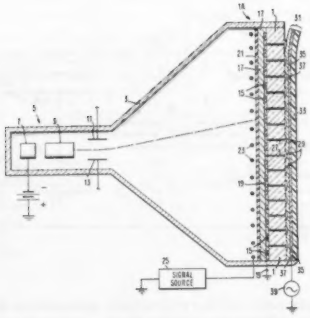
Positive ions of a gas are charged with electrons from a metallic vapor to provide negative ions of the gas by passing the positive ions through an isothermal enclosure into contact with a metallic vapor providing electrons. The metal providing the vapor is circulated in closed cycle in the enclosure in vapor form from a hot central portion to cooler end portions thereof and in liquid phase from the end portions of the enclosure toward the central portion of the enclosure.

3,825,791

FIELD-EFFECT STORAGE TUBE

Benjamin Kazan, Bedford Hills, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1972, Ser. No. 267,878
Int. Cl. H01j *31/08, 29/08*
U.S. Cl. 313—398 **6 Claims**



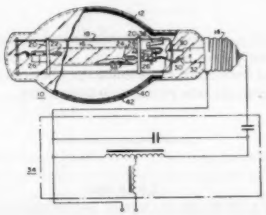
A field-effect storage cathode ray tube with layer of electroluminescent phosphor external to the tube to allow removal and replacement thereof. The inner surface of the tube faceplace is contacted with a conductive mesh. A layer of semicondutor then contacts the exposed inner surface of the faceplate in the mesh openings and a layer of insulator contacts the layer of semiconductor. An array of conductive pins extends through the faceplate from the layer of phosphor in contact with its outer surface to the semiconductor within the respective mesh openings. A charge pattern written on the layer of insulator acts to vary local conductivity in the semiconductor and thus vary alternating current flow through local pins to cause a pattern of light emission from the phosphor corresponding to the charge pattern.

3,825,792

NOVEL DISCHARGE LAMP AND COATING

Ferinand Rokosz, Clifton, and Joseph W. Sausville, Glen Rock, both of N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 3, 1973, Ser. No. 376,254
Int. Cl. H01j *1/62*
U.S. Cl. 313—109 **2 Claims**



A color corrected discharge lamp combination providing an emission with a very desirable color similar to that of an incandescent lamp, but maintaining the efficiency and long life advantages of a discharge lamp. The lamp is similar to a normal high-pressure mercury discharge lamp, but also contains a non-luminescent coating of silica, titania, magnesia or alumina or mixtures thereof on the interior surface of the outer envelope to provide a color-shift and a phosphor mixture coated over the non-luminescent coating. The phosphor mixture substantially comprises 70–90 percent by weight of yttrium vanadate phosphor or yttrium phosphate-vanadate phosphor and 10–30 percent by weight of magnesium fluoro-germanate or magnesium arsenate.

3,825,793

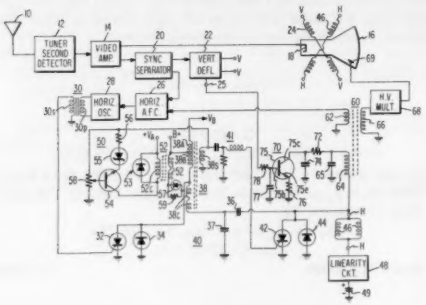
RASTER CORRECTION CIRCUIT UTILIZING A PARABOLICALLY VARYING LOAD CIRCUIT

Wolfgang Friedrich Wilhelm Dietz, New Hope, Pa., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 43,767, June 5, 1970, abandoned. This application Feb. 5, 1973, Ser. No. 329,617
Int. Cl. H01j *29/70*
U.S. Cl. 315—27 GD **20 Claims**

A raster correction circuit for a color television receiver provides side pincushion correction by utilizing a parabolically varying load circuit coupled in parallel relation with the horizontal yoke. In one embodiment, the load circuit includes a capacitor and a transistor driven by a vertical deflection frequency signal to be conductive during a portion of the vertical scan interval coupled across a direct voltage blocking capacitor which is serially coupled to the horizontal output

transformer. In another embodiment, an additional winding on the horizontal output transformer is loaded parabolically by the variable loading circuit to provide the desired correction. In a third embodiment, a direct current voltage



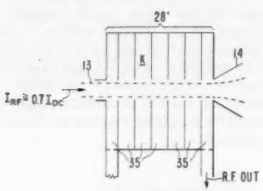
derived from a winding of the horizontal output transformer serves as the power supply for the vertical deflection stage. The vertical deflection stage loads the horizontal winding in a manner to provide side pincushion correction.

3,825,794

MICROWAVE TUBE HAVING AN IMPROVED OUTPUT SECTION

Robert J. Butwell, Cupertino, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Mar. 8, 1973, Ser. No. 339,444
Int. Cl. H01j *25/34*
U.S. Cl. 315—3.6 **10 Claims**



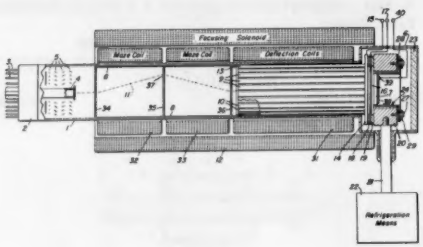
A microwave beam tube is arranged such that an upstream driver portion of the microwave circuit is severed for radio frequency energy from a downstream output microwave circuit portion. The driver section is dimensioned and arranged and driven with microwave energy such that the signal component of beam current has a peak value at the output end of the driver section which is not less than 0.7 times the d.c. beam current. This modulated beam current then excites a signal wave on the output microwave circuit portion which is amplified thereon and coupled to a load. The output microwave slow wave circuit portion is a fundamental space harmonic forward wave circuit, such as a cloverleaf circuit, centipede circuit or long slot coupled cavity circuit. The output circuit portion has a small signal gain of not more than 13 db to obtain increased RF conversion efficiency and stability for the tube.

3,825,795

PHOTOCONDUCTIVE CAMERA TUBE AND METHODS OF MANUFACTURE

Rowland W. Redington, and Pieter J. Van Heerden, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 56,799, Sept. 19, 1960, Pat. No. 3,781,955. This application Jan. 2, 1964, Ser. No. 344,155
Int. Cl. H01j *29/70*
U.S. Cl. 315—10 **14 Claims**



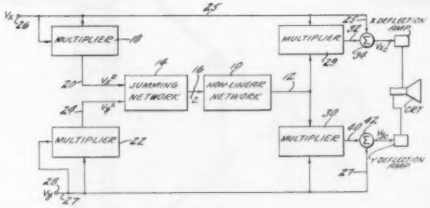
The object of this invention is to provide an improved photoconductive camera tube target of increased extended sensitivity utilizing a target composed of arsenic or antimony doped germanium semiconductor with the addition of copper to the semiconductor.

3,825,796

CRT GEOMETRY CORRECTION NETWORK

Vincent G. Bello, Norwalk, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Continuation of Ser. No. 155,094, June 21, 1971, abandoned. This application Jan. 26, 1973, Ser. No. 326,633
Int. Cl. H01j *29/70*
U.S. Cl. 315—27 GD **1 Claim**



Geometry distortion, caused by the radius of curvature of the face of a CRT being larger than the axial distance of the CRT beam source to the CRT face, is corrected by a network which is an implementation of the precise mathematical relationships which describe the correction of the geometry distortion. A nonlinear network is used to generate correction signals which are subtracted from the uncorrected deflection signals, thereby providing corrected deflection signals.

3,825,797

TIMING HOLDING DEVICE FOR HEAD LAMP CIRCUIT

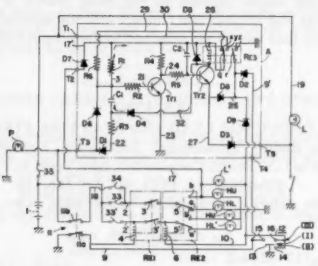
Tsuneo Maeda, and Masaichi Hattori, both of Nagoya, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Nishikasugai-gun, Aichi-ken, Japan

Filed Nov. 24, 1972, Ser. No. 309,480

Claims priority, application Japan, Nov. 25, 1971, 46-110494

Int. Cl. B60q 1/06

U.S. Cl. 315—83 5 Claims



A head lamp circuit of a motor car for lighting alternately upper and lower head lamps of the present device wherein, when, at night, on stopping and leaving his vehicle a driver turns the light switch off and the door switch on, the dimmer switch is momentarily switched to the upper headlamp holding position whereby the upper headlamp circuit is closed by the dimmer switch being momentarily switched to the upper headlamp holding position and held closed for a set time by a timed holding relay unit. Thus, if the vehicle is parked, for example, in a garage, the interior of the garage continues to be illuminated, which is of great convenience for persons leaving the garage.

3,825,798

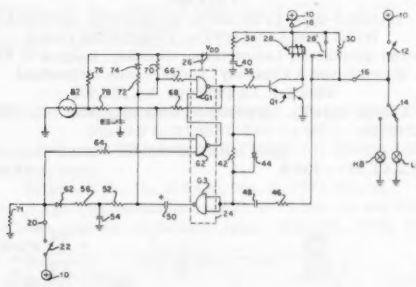
FLASHER AND DELAY HEADLIGHT CONTROL SYSTEM

Rudor M. Teich, 6040 Blvd., East, West New York, N.J. 07093

Filed June 4, 1973, Ser. No. 366,698

Int. Cl. B60q 1/06

U.S. Cl. 315—83 23 Claims



There is disclosed an auxiliary circuit for connection to the electrical system of an automobile for controlling headlight flashing and delay functions. When the headlight switch is off, operation of the dimmer foot switch causes the headlights to be turned on for a brief interval. During daylight driving, when the ignition switch is on, each operation of the dimmer foot switch causes the headlights to flash on for ½ second to attract the attention of a driver of a car in front. When the ignition switch is off, for example, after the car has been parked in a driveway, the operation of the dimmer foot switch causes the headlights to turn on for one minute to illuminate the driveway while the driver enters his house. In both cases, no additional switches or knobs are required — the dimmer foot switch, which ordinarily serves no function when the headlight switch is off, can be used to control both of the new headlight functions; which of the two headlight functions is controlled depends on the position of the ignition switch.

3,825,799

ANTI-SKID CONTROL SYSTEM FOR VEHICLES

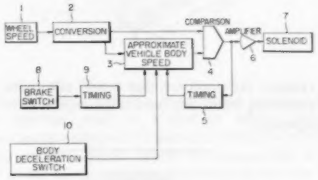
Yoshihiro Matsumura, Yokosuka, Japan, assignor to Sohgoh Jidosha Azen Kogai Gijutsu Kenkyu Kumiai, Tsuchiyama, Himeji, Japan

Filed Aug. 2, 1973, Ser. No. 385,071

Claims priority, application Japan, Nov. 10, 1972, 47-112154

Int. Cl. B60t 8/08

U.S. Cl. 317—5 4 Claims



An anti-skid control system for vehicles comprising a wheel speed detector, a converter consisting of a pulse generator and an integrator, an approximate vehicle body speed signal generator including an RC discharge circuit, and a comparator for comparing the output of the approximate vehicle body speed signal generator with the output of the converter for energizing and deenergizing a solenoid operated valve in the brake fluid pressure control means. The integrator includes a charging resistor and a discharging resistor whose resistance ratio is suitably selected so that the output of the converter varies substantially as an exponential function of the input frequency applied thereto thereby obtaining an approximate vehicle body speed having substantially constant deceleration.

3,825,800

MATRIX-MOUNTING FRAME FOR MULTI-CONTACT ELECTRICAL COMPONENTS

Bloomfield James Warman, Milan, Italy; Kenneth Frederick Elliott, and Jack Frederick Kennard, both of Bexley, England, assignors to GTE International Incorporated, New York, N.Y.

Filed Dec. 27, 1972, Ser. No. 318,816

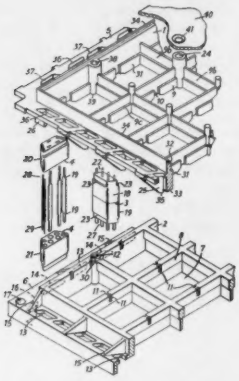
Claims priority, application Great Britain, Apr. 20, 1972, 18,465/72

Int. Cl. H02b 1/04

U.S. Cl. 317—99 2 Claims

A molded frame assembly for mounting a matrix of electrical components, such as miniature multicontact relays. The frame assembly has an upper and lower section, each with central and peripheral socket portions between which the relays and the terminal assemblies for these relays are clamped, respectively. Provisions are made so that relays can be individually removed from the frame assembly by merely loosening the screws which hold the two sections together and laterally displacing the corresponding individual relay retaining members. Each of the various terminal assemblies which are disposed along the edges of the frame assembly has a pair of molded, axially aligned, cooperating terminal-receiving members with inner shoulders engaging opposite shoulders formed on the terminals, and with outer shoulders engaged, in turn, by the above peripheral socket portions in the upper and

lower sections, respectively of the frame assembly. The use of terminal receiving members separate from the mounting



frame reduces the precision that would otherwise be required of the mounting frame and lowers the capital cost of the molding equipment.

3,825,801

ELECTRICAL INTEGRATED CIRCUIT PACKAGE

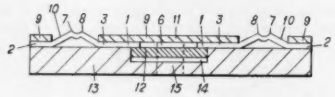
Alan Robert Beavitt, Towcester, and John Peter McCarthy, Weston Favell, both of England, assignors to Plessey Handel Und Investments A.G., Zug, Switzerland

Filed Jan. 30, 1973, Ser. No. 327,904

Claims priority, application Great Britain, Feb. 23, 1972, 8257/72

Int. Cl. H05k *5/00*

U.S. Cl. 317—101 CP **4 Claims**



An integrated circuit package includes conductors (3) bonded between a cover (9) and a base (13) which has a cavity (14) in which a chip (12) is received. Each conductor (3) joins an attach pad (1) which protrudes into the cavity (14) with a contact (2) which projects (7, 8) through a window (10) in the cover (9). When bolted (20) to a printed circuit board (16), the contact projections (7, 8) make contact with contact areas (18) on the board.

3,825,802

SOLID CAPACITOR

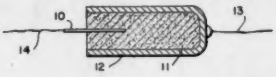
Henry Yasuo Kumagai, Lower Macungie Township, Lehigh County, Pa., and Hugh Morris McKnight, Lewisville, N.C., assignors to Western Electric Company Incorporated, New York, N.Y.

Filed Mar. 12, 1973, Ser. No. 340,518

Int. Cl. H01g *9/05*

U.S. Cl. 317—230 **8 Claims**

An improved solid capacitor is disclosed. The capacitor comprises a porous body of compressed particles of a film-forming metal suitably doped with a dopant selected from the group comprising N, Si, P, B and mixtures thereof. An electrolytically formed dielectric oxide film of the film-forming metal covers the exposed surface of each of the particles. Impregnating the body and in intimate contact with the dielectric film is a layer of manganese dioxide. A layer of graphite overlies the layer of manganese dioxide and a metal casing encom-



passes the major portion of the body which is insulated therefrom and in electrical contact with the layer of graphite. Electrical lead means are attached to the porous body and the casing.

3,825,803

SEMICONDUCTOR LEAD AND HEAT SINK STRUCTURE

Herman Budde, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 26, 1973, Ser. No. 345,136

Claims priority, application Netherlands, Apr. 6, 1972, 7204574

Int. Cl. H01l *3/00, 5/00*

U.S. Cl. 317—234 R **5 Claims**

A semiconductor device, for example, an integrated circuit, comprising a flexible insulating foil which has conductor tracks to which a semiconductor element is connected. A cooling element which preferably extends in the longitudinal direction of the foil is connected to the rear side of the semiconductor element but does not cover the ends of the conductor tracks remote from the seminconductor body. The cooling member comprises raised portions which extend to against the foil and are soldered or welded to metallized contact places on the foil. The longitudinal ends of the cooling member may be provided with bent connection portions which also serve as abutments, for example, during the connection in a slot-like aperture of a mounting panel or on an insulating substrate.

3,825,804

CLAMPED DISC TYPE SEMICONDUCTOR ASSEMBLY WITH BUILT-IN CONTACT PRESSURE GAGE

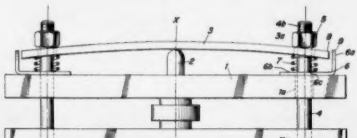
Bernd Amelunxen, Lampertheim, Germany, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Feb. 22, 1973, Ser. No. 334,975

Claims priority, application Germany, Mar. 3, 1972, 2210180

Int. Cl. H01l *3/00, 5/00*

U.S. Cl. 317—234 R **1 Claim**



A clamped semiconductor disc assembly wherein the semiconductor disc is located between a pair of pressure plates and the clamping force is applied by way of a leaf spring

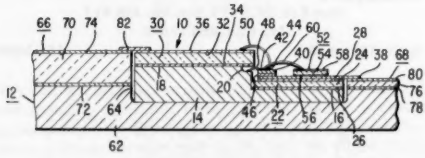
and clamping bolts which extend through the pressure plates and the end portions of the leaf spring. As the bolts are tightened, a clamping pressure is transmitted from a contact point at the center of the leaf spring to a projection provided on one of the pressure plates, the pressure being transmitted through the projection to the pressure plate and thence to the semiconductor disc along an axis coincident with the center of the disc. Simultaneously the projection functions as a fulcrum for the leaf spring resulting in a deflection of the end portions of the spring, and the amount of this deflection thus becomes a measure of the clamping force which can be read off on a scale type gage, wherein the end of the spring serves as the pointer element of the gage in association with a stationary scale supported by the pressure plate.

3,825,805

TRANSISTOR CARRIER FOR MICROWAVE STRIPLINE CIRCUIT

Erwin Franz Belohoubeck, Kendall Park, and David Michael Stevenson, Hightstown, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 24, 1973, Ser. No. 363,629
This application of Ser. No. 156,814, June 25, 1971, abandoned.
Int. Cl. H01l *3/00, 5/00*
U.S. Cl. 317—234 R **8 Claims**



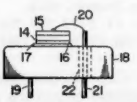
A transistor carrier adapted to be mounted in a microwave transmission line including a metal substrate which is adapted to be connected to the ground plane of the transmission line and a pair of impedance transmission line segments mounted in spaced relation on the substrate. A transistor having base emitter and collector contacts is mounted on one of the transmission line segments with the collector electrode being electrically connected to the transmission line. One of the base or emitter electrodes is electrically connected to the substrate and the other is electrically connected to the other transmission line segment. A series capacitor-impedance element compensating network is mounted on the same transmission line segment as the transistor and is electrically connected between the transmission line and the electrode of the transistor which is connected to the substrate.

3,825,806

OPTICAL SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME

Hiroyuki Kasano, Akishima, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 212,430, Dec. 27, 1971, Pat. No. 3,745,423. This application June 13, 1973, Ser. No. 369,463
Claims priority, application Japan, Dec. 25, 1970, 45-130686
Int. Cl. H01l *15/00*
U.S. Cl. 317—234 R **1 Claim**



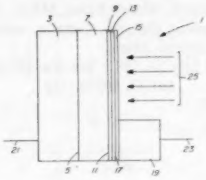
Light-emitting semiconductor devices consist of a crystal having a Ge concentration of less than 1 ppm and a p-n junction and the method of manufacturing the same. The light-emitting semiconductor device has emission peaks at 1.57 eV in a visible band and can be manufactured inexpensively compared to the conventional light-emitting semiconductor devices.

3,825,807

HIGH GAIN BARRIER LAYER SOLID STATE DEVICES

Edward L. Wolf, Brockport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 15, 1973, Ser. No. 323,607
Int. Cl. H01l *15/00*
U.S. Cl. 357—30 **16 Claims**



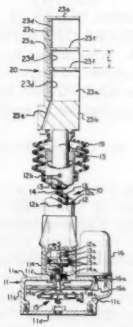
A radiation responsive device is disclosed having a barrier generating material, such as a dye or metal, interposed between two semiconductive elements, at least one of which is radiation penetrable. Metal layers are associated with the outer faces of the semiconductive elements so that the device can be biased by an externally applied potential. Radiation absorbed adjacent the barrier generating material produces a current gain in the forwardly biased device. The device can be fabricated by successively vacuum depositing upon a semiconductive element surface a layer of a barrier generating material, a semiconductive overlayer and a metal layer. The metal layer can be chosen to form a rectifying junction with the semiconductive overlayer. The barrier generating material is chosen to exhibit a surface photovoltage when applied to the surface of one of the semiconductive elements.

3,825,808

SIGNAL-SEEKING, POWER-DRIVEN MAST FOR USE IN LASER BEAM CONTROLS AND SURVEYING SYSTEMS

Ted L. Teach, Springfield, Ohio, assignor to Lasserplane Corporation, Dayton, Ohio

Filed May 10, 1973, Ser. No. 358,881
Int. Cl. G05d *3/04*
U.S. Cl. 318—266 **3 Claims**



This invention relates to the construction of a power-driven extensible mast for mounting a photocell unit which is utilized to detect a laser beam which is periodically swept over a work-

ing area at a known elevation. Suitable circuits are provided between the photocell unit carried by the extensible mast and a motor unit which effects the raising and lowering of the mast to automatically maintain the mast at a height corresponding to exact vertical alignment with the photocell unit with the laser beam.

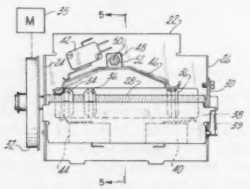
Another feature of the invention is the provision of automatic limit switch means which function to reverse the direction of the driving motor when the mast reaches either the top or bottom extremity of its vertical movement.

3,825,809

GARAGE DOOR POWER OPERATOR HAVING PARTIAL OPEN CAPABILITY

Geoffrey W. Gatland, Walled Lake, Mich., and Kenneth L. Robitaille, Windsor, Ontario, Canada, assignors to Vemco Products, Inc., Detroit, Mich.

Filed July 23, 1973, Ser. No. 382,029
Int. Cl. H02p *1/22*
U.S. Cl. 318—282 **7 Claims**



An automatic power operator for garage doors having adjustable limit stops including a short screw shaft driven by the operator motor and a pair of traveler nuts on the screw shaft and individually adjustable in linear position to establish up and down limits of travel. The travelers nuts operate in connection with up and down limit switches to shut off power to the drive motor after the predetermined limit of travel has been reached. A "memory" device in the form of a pivotal lever is disposed adjacent the screw shaft and the down limit switch to hold the down limit switch in the open circuit condition until the door is nearly fully opened such that a second actuation of the device following initiation of movement in the upward direction simply causes the operator motor to stop. By this feature any of an infinite number of partially opened door positions can be readily accomplished by the user.

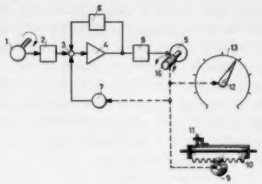
3,825,810

SERVOMECHANISM, PARTICULARLY A VEHICLE SPEEDOMETER OR TRIP-RECORDER

Norbert Helmschrott, Schwenningen, Germany, assignor to Kienzle Apparate GmbH, Villingen/Schwarzwald, Germany

Filed June 23, 1972, Ser. No. 265,797
Claims priority, application Germany, June 26, 1971, 2131915
Int. Cl. G05b *5/01*
U.S. Cl. 318—618 **10 Claims**

A servomechanism, particularly a vehicle speedometer or trip-recorder includes a controlled member, such as a speedometer needle or a trip-recorder scribe, as well as a servomotor and a drive gear driven by the servomotor. A servoamplifier has an output connected to the servomotor and a differential input. A command unit connected to the amplifier input furnishes thereto signals indicative of a commanded position for the controlled member. A feedback transducer furnishes to the amplifier input signals indicative of the position of the controlled member, and has a transducer input gear driven by the drive gear and defining therewith a first meshing region having a predetermined orientation relative to the axis of the transducer input gear. A driven gear driven by the transducer input gear and driving the controlled member, defines with the transducer input gear a second meshing region having a predetermined orientation relative to the axis of said trans-



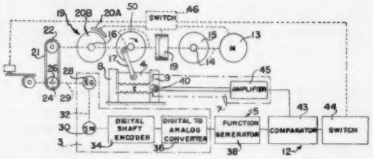
ducer gear which is angularly offset from the orientation of the first meshing region by an angle of substantially less than 180°, and most advantageously, 0°.

3,825,811

SYSTEM AND METHOD FOR MONITORING A PRESS LOAD

Herman W. Smith, Vancouver, Wash., and Paul H. Berka, Apollo, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Feb. 26, 1973, Ser. No. 335,913
Int. Cl. G05d *15/00*
U.S. Cl. 318—646 **11 Claims**



A system and method for monitoring the load on a forming press during its work cycle including a digital encoder operably connected by a servomechanism to a timing mechanism on the press so as to provide a digital output determinative of any given position of the press ram during its work cycle. A digital-to-analog converter converts the digital signal to an analog signal indicative of the ram position. The analog signal is directed to a function generator which is pre-programmed to produce a signal representative of a predetermined tolerable stress load on the press at such position of the press ram. This representative signal is compared to the actual stress load on the press, as measured by one or more strain sensing devices associated with the press, so as to produce a warning signal and/or to stop the press ram at a selected time in the work cycle when the actual load on the press exceeds the predetermined tolerable load for the system.

3,825,812

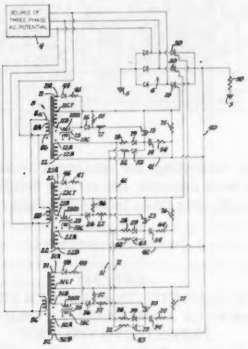
RECTIFIER BRIDGE SILICON CONTROLLED RECTIFIER TRIGGER CIRCUIT

Alfred P. De Buhr, Downers Grove, Ill., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 11, 1973, Ser. No. 350,078
Int. Cl. H02m *1/08*
U.S. Cl. 321—5 **3 Claims**

Corresponding to each silicon controlled rectifier of a three-phase bridge rectifier circuit is a center tapped and an untapped secondary winding pair of a three-phase transformer, a pilot silicon controlled rectifier, a capacitor and an output winding of a magnetic amplifier. Each center tapped secondary winding supplies gate-cathode current to the pilot

silicon controlled rectifier which corresponds to the same bridge circuit silicon controlled rectifier through the corresponding output winding of the magnetic amplifier. Each untapped secondary winding supplies gate-cathode current to the corresponding bridge circuit silicon controlled rectifier through the anode-cathode electrodes of the corresponding



pilot silicon controlled rectifier and charging current to the corresponding capacitor. Each capacitor is also connected across another one of the untapped secondary windings which places a charge thereon prior to the time the corresponding pilot silicon controlled rectifier is triggered conductive through the anode-cathode electrodes.

3,825,813

MULTI-PHASE THYRISTOR INVERTER CIRCUIT

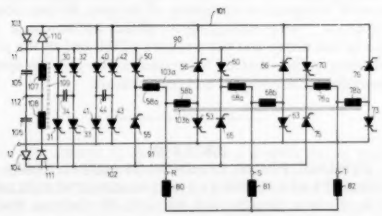
Rainer Wirtz, Unterriexingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed July 16, 1973, Ser. No. 379,849

Claims priority, application Germany, Aug. 10, 1972, 2239396

Int. Cl. H02m 7/52

U.S. Cl. 321—5 **12 Claims**



To provide for better high speed performance of motors which are connected to a multi-phase thyristor inverter, the thyristor inverter has separate return feed lines, isolated from the supply source by diodes, and separate groups of return feed thyristors which are energized after cut-off of the main current supplying thyristors, to conduct stored energy fed back into the supply source through the separate lines and diodes after cut-off of the conducting thyristors.

3,825,814

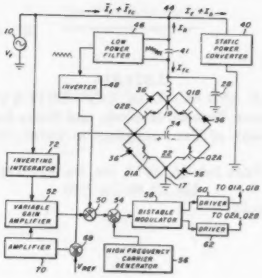
ACTIVE FILTER FOR THE INPUT HARMONIC CURRENT OF STATIC POWER CONVERTERS

Brian R. Pelly, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 29, 1973, Ser. No. 364,451

Int. Cl. H02m 1/12

U.S. Cl. 321—9 A **8 Claims**



An active filter for the input harmonic currents of static power converters comprising an active harmonic voltage generator connected in series with a passive reactive element, the series combination being connected across the converter input terminals. The passive reactive element is such that essentially the full-line voltage appears across the passive reactive element whereby the volt-ampere rating of the active harmonic voltage generator can be materially reduced.

3,825,815

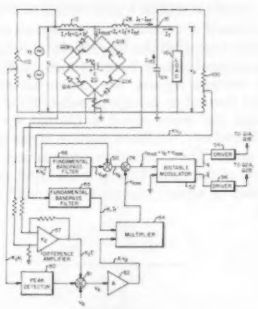
ELECTRICAL POWER SYSTEM

Laszlo Gyugyi; Eric J. Stacey, and Eugene C. Strycula, all of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 12, 1973, Ser. No. 369,333

Int. Cl. H02m 1/12

U.S. Cl. 321—9 A **15 Claims**



Active power filters interposed between an electrical power source section and a load section for generating a synthetic ripple which opposes and effectively eliminates an electrical ripple generated in one of the sections, either the source or the load. In the preferred embodiments of the invention, the synthetic ripple is generated by means of static semiconductor switches from direct current or direct voltage storage elements such as inductors or capacitors, the charge on these elements being obtained and maintained from the power source by appropriate control, and static semiconductor switches rated to handle only the ripple components. The active filters that are described herein have nearly an ideal characteristic.

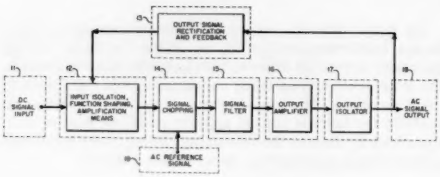
That is, they allow only the fundamental component of the input waveform to pass to the output, without appreciable attenuation, while rejecting all other components regardless of their frequency and independently of whether they are generated by the power source or the load. As compared to prior art filters employing some form of controllable attenuator, the filters of the present invention have substantially higher efficiency and appreciable weight and size reductions over conventional passive L-C filters.

3,825,816

DC-TO-AC AND AC-TO-DC CONVERTER SYSTEMS

Mauro Giusepee Togneri, Houston, and Harry Samuel Elliott, Stafford, both of Tex., assignors to Varco, Inc., Houston, Tex.

Filed July 16, 1973, Ser. No. 379,331
Int. Cl. H02m *7/00*
U.S. Cl. 321—18 **15 Claims**



A signal conversion system wherein variable amplitude, direct current or voltage signals from instrument sensors, which represent the magnitude of measured physical variables by amplitude modulated direct current or voltage signals, are converted to variable amplitude alternating current voltage signals at a frequency determined by the reference signal frequency of the said signal conversion system (usually 60 cycles) (FIG. 1) and a second signal conversion system wherein variable amplitude alternating current signals from instrument sensors, which represent the magnitude of measured physical variables or control signals by amplitude modulated alternating current voltage signals, are converted to variable amplitude direct current or voltage signals (FIG. 2). In both types of conversion, the input signal is filtered for normal mode noise and filtered by a feedback portion of the system for common mode noise. The conversion process also includes mangitude scaling of the variable amplitude input signal, including but not limited to, square root extraction and linear amplitude adjustment.

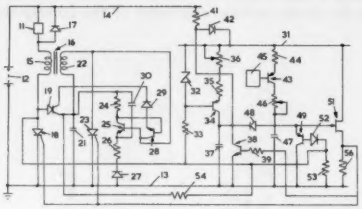
3,825,817

THYRISTOR CHOPPER CIRCUITS

Hardev Reval, London, England, assignor to C.A.V. Limited, Birmingham, England

Filed July 3, 1973, Ser. No. 376,157
Claims priority, application Great Britain, July 6, 1972, 31593/72
Int. Cl. H02m *7/52*
U.S. Cl. 321—45 C **3 Claims**

A thyristor chopper circuit has a main thyristor for supplying current to a load and a commutating capacitor for turning the main thyristor off. The capacitor is charged by a saturating transformer when the main thyristor conducts, the primary winding of the saturating transformer being connected in series with the main thyristor, and current limiting means being



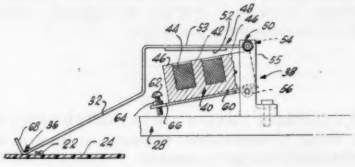
provided for restricting the maximum mean current flow through the main thyristor, the current limiting means being responsive to the time taken for the transformer to saturate.

3,825,818

ELECTROMAGNETIC TRANSDUCER FOR SENSING MOVEMENT OF A THREAD-LIKE OBJECT PAST A PREDETERMINED POINT

Leonard A. Mayberry, 735 Nancy St., Escondido, Calif. 92025

Filed June 29, 1972, Ser. No. 267,652
Int. Cl. G01r *33/00*
U.S. Cl. 324—34 R **5 Claims**



An electromagnetic transducer for sensing the passage of a wire under a probe connected to the transducer and generating a signal in response thereto. The probe configuration is such that as the end of the probe falls off the trailing side of the wire, a relatively constant output signal is generated regardless of the speed of movement of the wire. An electromagnet is continuously energized to attract an armature connected to the probe and the pressure of the end of the probe against a reference surface is adjusted by varying the spacing between the electromagnet and the armature.

3,825,819

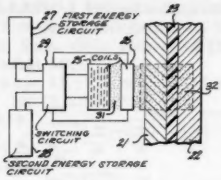
DYNAMIC PROOF LOADING OF METAL BOND STRUCTURES USING PULSED MAGNETIC FIELDS

Karl A. Hansen, Seattle, and Clarence D. Lunden, Federal Way, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Mar. 12, 1973, Ser. No. 340,191
Int. Cl. G01b *19/02*
U.S. Cl. 324—34 R **18 Claims**

A method and apparatus for developing tensile stress within bonded metal structures. A magnetic field is first developed slowly in the bonded metal structure by pulsing a coil adjacent the metal structure with a high energy electric pulse. At substantially the peak of the slow high energy pulse, a comparatively fast pulse in an opposing current direction is applied

through the coil adjacent the same surface. The fast negative pulse effectively shuts off the slow pulse, resulting in a very rapid decrease in the magnetic field adjacent the surface of the metal structure. The magnetic field internal the structure initially established by the slow pulse is, during the fast negative pulse, at or near a maximum, and just beginning to diffuse through the structure. This creates a large negative magnetic field gradient across the structure from internal the structure to the surface nearest the coils, and thus, a resulting large tensile stress on the bond line.



3,825,820

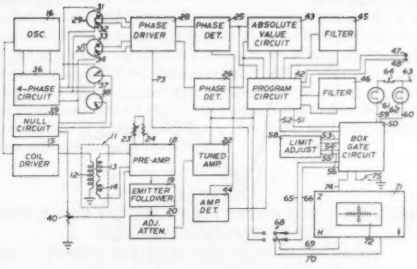
GATE CIRCUIT FOR NON-DESTRUCTIVE TESTING SYSTEMS FOR INDICATING WHEN TEST SIGNALS LIE WITHIN PREDETERMINED LIMITS

John J. Flaherty, Elk Grove, and Eric J. Strauts, Harwood Heights, both of Ill., assignors to Magnaflux Corporation, Chicago, Ill.

Filed Oct. 31, 1972, Ser. No. 302,518

Int. Cl. G01r *33/12*

U.S. Cl. 324—37 **18 Claims**



Box gate circuit is disclosed for non-destructive testing systems such as eddy current testing systems in which first and second signals in phase quadrature relation are developed. The circuit preferably includes first and second adjustable limit circuits and first and second comparator circuits coupled to a gate circuit to develop an output signal only when the amplitude of the first signal is between limits set by the first limit circuit and the amplitude of the second signal is concurrently between limits set by the second limit circuit. Monitoring means are provided preferably including an oscilloscope and a multiplexer arrangement alternately applies the first and second signals and slow and fast sawtooth signals to the horizontal and vertical inputs of the oscilloscope with intensity of the oscilloscope spot being controlled from the output of the box gate circuit.

3,825,821

MAGNETIC PARTICLE FLAW DETECTOR USING AN ELECTRON BEAM SCANNER TO GENERATE PULSES REPRESENTATIVE OF THE IMAGE OF THE FLOW PROJECTED ON THE SCANNER SCREEN

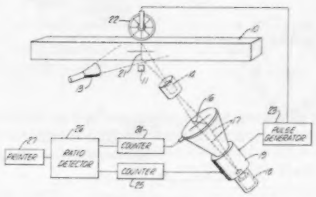
Friedrich Martin Forster, Grathwohlstrasse 4, D-7410 Reutlingen, Germany

Filed Feb. 20, 1973, Ser. No. 334,088

Claims priority, application Germany, Feb. 26, 1972, 2209146

Int. Cl. G01r *33/12*

U.S. Cl. 324—38 **8 Claims**



In testing ferromagnetic bodies for surface defects by magnetic powder techniques, an image of a magnetized test body treated with magnetic powder is formed on the screen of an electron beam scanner arranged to scan the image and generate signals representing image intensity. The scanner develops pulse signals on scanning of defects marked by the magnetic powder which serve to identify the existence and magnitude of such defects. Such signals are utilized to spray mark defect locations or actuate processing circuits to identify magnitude and kind of defects.

3,825,822

APPARATUS FOR INSPECTING THE QUALITY OF SHORT, ELECTRICALLY CONDUCTIVE WORKPIECES BY THE EDDY CURRENT TEST METHOD

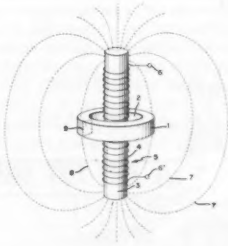
Friedrich M. O. Forster, Grathwohlstrasse 4, 7410 Reutlingen, Germany

Filed May 29, 1973, Ser. No. 364,608

Claims priority, application Germany, Sept. 23, 1972, 2246871

Int. Cl. G01r *33/00*

U.S. Cl. 324—40 **9 Claims**



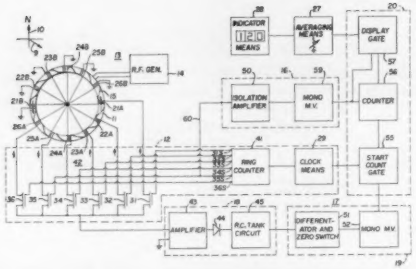
Short apertured electrically conductive workpieces, such as nuts, ball bearing races or wrist pins are inspected by the eddy current test method by establishing an alternating magnetic field which causes eddy currents in the workpiece portion surrounding the aperture. The magnetic field is shaped in such a manner as to prevent a significant portion of the magnetic lines from being intercepted by the workpiece.

3,825,823

APPARATUS FOR DETECTING THE DIRECTION OF A MAGNETIC FIELD RELATIVE TO A MARKER DIRECTION BY SEQUENTIALLY SCANNING PLURAL STATIONARY SENSORS

Leopold Rovner, 2201 Acacia Park Dr., Cleveland, Ohio 44124

Filed Jan. 21, 1972, Ser. No. 219,725
Int. Cl. G01r 33/02
U.S. Cl. 324—43 R 14 Claims



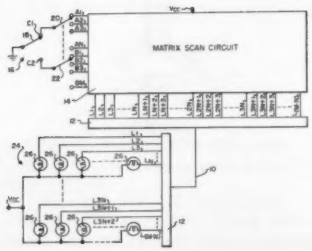
An apparatus to detect the direction of an external magnetic field is disclosed incorporating a flux gate magnetometer having a plurality of sensing coil arrays. A scanner sequentially connects each sensing array to a detector to determine the sensing coil system which is in orthogonal alignment with the external magnetic field. A marker device is incorporated into the apparatus to produce an output to the detector when the scanning sequence is in alignment with a marker direction. The apparatus can incorporate a numerical readout to indicate the direction of external magnetic field relative to the marker direction.

3,825,824

MATRIX SCANNING CIRCUIT FOR TESTING A MULTIPLICITY OF CIRCUIT PATHS

Roger G. Herron, Clearwater, Fla., and Stanley F. Hon, Morton Grove, Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed June 1, 1973, Ser. No. 366,222
Int. Cl. G01r 31/02
U.S. Cl. 324—51 7 Claims



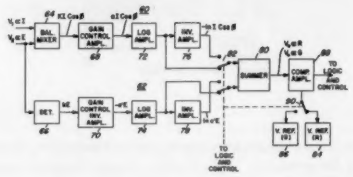
A diode matrix scan circuit having $m + n$ inputs and $m \times n$ outputs for testing $m \times n$ circuit paths in $m + n$ operations of a scanning rotary switch.

3,825,825

AUTOMATIC ANTENNA COUPLER UTILIZING SYSTEM FOR MEASURING THE REAL PART OF THE COMPLEX IMPEDANCE OR ADMITTANCE PRESENTED BY AN ANTENNA OR OTHER NETWORK

Carl M. Smolka, Skinner Rd., Marion, N.Y. 14505

Division of Ser. No. 229,215, Feb. 18, 1972, which is a continuation-in-part of Ser. No. 7,619, Feb. 2, 1970, abandoned. This application Sept. 4, 1973, Ser. No. 393,843
Int. Cl. G01r 27/00
U.S. Cl. 324—57 R 6 Claims



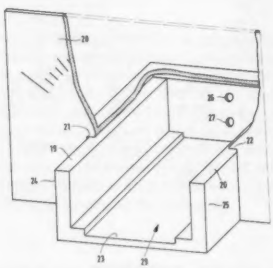
An automatic antenna coupler is described which includes a matching network having adjustable reactive elements. Control for these elements is provided by a system for detecting the real part of the complex impedance presented by the antenna or matching network. A logic and control system for adjusting the reactive elements is operated in accordance with the real part detector output so as to provide the desired impedance match.

3,825,826

MEASURING INSTRUMENT FOR THE MEASUREMENT OF DIRECT CURRENT OR DIRECT CURRENT VOLTAGE

Josef Thannhuber, Landau, Germany, assignor to Firma Hank Einhell, Landau, Germany

Filed Dec. 4, 1972, Ser. No. 311,570
Claims priority, application Germany, Dec. 3, 1971, 2160169
Int. Cl. G01r 1/20
U.S. Cl. 324—147 11 Claims



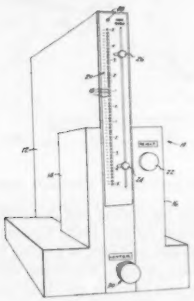
A measuring instrument for measuring direct current or direct current voltage comprising a synthetic plastic body having first and second parallel chambers; an indicator support member pivotally mounted in the first chamber with a plate of soft magnetic material and an indicator pointer attached thereto; a bar magnet clamped in the second chamber with the longitudinal axis of the magnet lying approximately in the plane of the plate of magnetic material; said magnet determining by virtue of its position with reference to the magnetic plate, the position of the plate and the orientation of the indicator pointer; and a measuring coil surrounding the plastic body in such a manner that when the current or voltage to be measured is conducted through the coil, the field lines of the

measuring coil extend approximately perpendicular to the direction of magnetization of the bar magnet; said plastic body and measuring coil being received in a receptacle in a scale supporting member such that the indicator pointer is located immediately in front of the scale.

3,825,827
COLUMNAR DISPLAY FOR ELECTRICAL SIGNALS WITH DIGITAL SIGNAL LIMIT SET

Gerald Tumbush, Xenia, Ohio, assignor to The Bendix Corporation, Southfield, Mich.

Filed Apr. 13, 1972, Ser. No. 243,649
Int. Cl. G01r *19/16, 13/02*
U.S. Cl. 324—103 P **9 Claims**



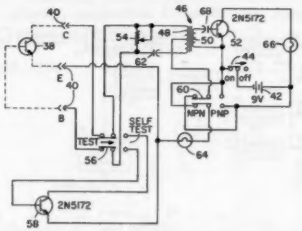
A system for displaying the level of a variable electrical signal is disclosed, in which the variable electrical signals are converted into digital form, which are in turn decoded and arranged to consecutively activate a vertical series of indicator elements up and down the series in response to increases and decreases respectively in the digital signal, and with any preceding activated element being deactivated so that only a single individual indicator element corresponding to each digital signal is activated. Accordingly, the rise and fall of the position of the activated indicator element indicates the level of the electrical signal. An arrangement is also disclosed for providing signal limit indication comprising means for comparing the digital signal corresponding to the variable electrical signal with preset digital limit signals which means drives a limit indicator element whenever the generated digital signal is outside the preset values.

3,825,828
DEVICE FOR TESTING SEMICONDUCTORS AND OTHER ELECTRICAL COMPONENTS

John C. Pfeiffer, 560 Garden Dr., Louisville, Ky. 40206

Filed Dec. 21, 1972, Ser. No. 317,409
Int. Cl. C01r *31/22*
U.S. Cl. 324—158 T **11 Claims**

A device for testing the dynamic operation of semiconductor and other electrical components which may exhibit amplifier characteristics, having circuitry adapted to form an electronic oscillator in association with such a component, an amplifier stage coupled to the circuitry, and an indicator lamp connected to the amplifier stage to detect the presence of oscillations in the circuitry. An additional feature includes a second indicator lamp connected to the circuitry to detect current flow through various electrodes of the component under test to indicate its d.c. electrical continuity. The polarity of a d.c. potential applicable to the component being tested is reversible to permit testing of the dynamic properties of both PNP and NPN type semiconductors as well as for testing the rectifier properties of transistor junctions, diodes, thyristors and other electrical components. The device also features means for testing its own operation including a transistor which may be switched into the circuitry of the oscillator stage in place of the component to be tested. Collector feedback

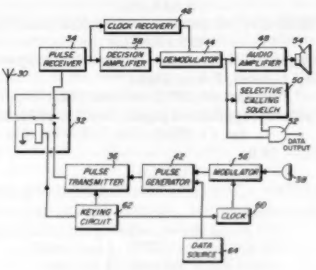


bias is utilized in the operation of the oscillator stage to minimize thermal instability thereof and to permit operation of the stage at radio frequencies.

3,825,829
RADIO SYSTEM EMPLOYING SIMULTANEOUSLY TRIGGERED PULSE REPEATERS

William V. Braun, Lauderhill, Fla., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Jan. 29, 1973, Ser. No. 327,332
Int. Cl. H04b *7/18*
U.S. Cl. 325—6 **13 Claims**



An asynchronous radio repeater system for providing radio coverage within a large building or the like employs a plurality of pulse repeaters distributed over the communications area. Each repeater receives oscillation pulses from a portable pulse transmitter or from another repeater and transmits pulses of oscillations having substantially the same frequency as the received oscillations. A blanking system is incorporated in each repeater to disable the repeater for a predetermined time duration following tee transmission of a pulse to prevent self-sustaining oscillation of the system.

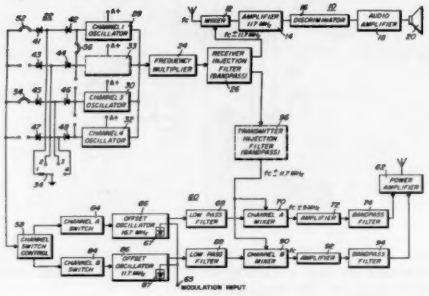
3,825,830
OFFSET OSCILLATOR SYSTEM FOR RADIO TRANSMITTER AND RECEIVER

William W. O'Connor, Lombard, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Dec. 6, 1972, Ser. No. 312,460
Int. Cl. H04b *1/40*
U.S. Cl. 325—20 **7 Claims**

An oscillator system for determining the operating frequency of a transmitter and a receiver includes a receiver local oscillator and an oscillator-mixer combination for off-setting

the frequency of the local oscillator to provide an excitation signal for the transmitter. The operating frequency of the transmitter and receiver can be changed by changing only the



frequency of the local oscillator, thereby reducing the number of crystals or oscillators needed for a multifrequency radio. The offsetting oscillator is frequency modulated to frequency modulate the transmitter.

3,825,831

DIFFERENTIAL PULSE CODE MODULATION APPARATUS

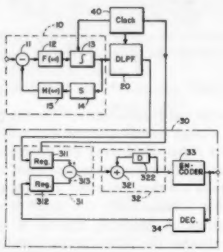
Tatsuo Ishiguro, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Oct. 26, 1971, Ser. No. 192,198

Claims priority, application Japan, Oct. 28, 1970, 45-95370

Int. Cl. H04b *1/00, 7/00*

U.S. Cl. 325—38 B **2 Claims**



A differential pulse code modulator includes a delta modulator for converting an analog input signal to a delta modulated signal, a digital filter for removing quantizing noise components, and a direct feedback pulse code modulation encoder. The feedback encoder includes a subtractor for determining the difference between a decoded digital signal and the output of the digital filter, a digital integrator for integrating the output of the subtractor, a digital coder for converting the output of the integrator to a differential pulse code modulation signal and a digital decoder for converting the differential signal to the decoded digital signal supplied to the subtractor. Clock pulses are supplied to the delta modulator, the digital filter, and the direct feedback pulse code modulation encoder.

3,825,832

METHOD AND DEVICE FOR CODING AND DECODING VIDEO SIGNALS

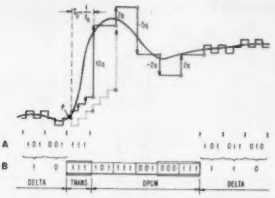
Armin H. Frei, Rueschlikon; Hans R. Schindler, Au, and Peter Vettiger, Thalwil, all of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 22, 1972, Ser. No. 255,489

Claims priority, application Switzerland, Jan. 5, 1972, 8113/71

Int. Cl. H03k *13/22*

U.S. Cl. 325—38 B **12 Claims**



Method and device for coding and decoding video signals employing two different modes: Delta Coding for regions of minor amplitude changes, and DPCM Coding for edges which exhibit large amplitude changes. Switching between modes is effected by the bit stream carrying the video information, with a minimum of extra marker bits. Further improvement is achieved by using a higher scanning frequency for delta coding and transferring a reduced number of bits extracted by majority selection.

3,825,833

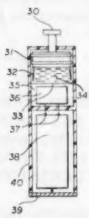
PERSONAL SECURITY DEVICE

John C. Bogue, 101 Ocean Ave., and Robert I. Sarbacher, both of Santa Monica, Calif., assignors to said Bogue, by said Sarbacher

Filed May 18, 1972, Ser. No. 254,409

Int. Cl. H04b *1/02*

U.S. Cl. 325—119 **10 Claims**

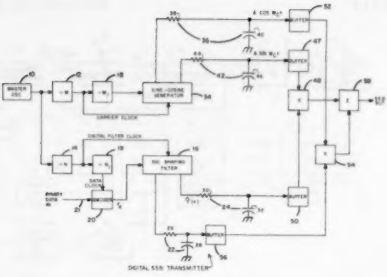


A self-powered electromagnetic signaling device having the appearance of a lipstick, ring, cigarette lighter, hotel or motel key or any other device commonly worn on the person or carried is disclosed. The device utilizes a reserve battery that remains inactive until actuated. Since the battery remains inactive unless actuated, the power source for the signaling device has a long stand-by life. The battery is actuated by a pushing, turning or pressing motion that can be accomplsihed without attracting attention. Once the battery is activated, the device emits a continuous signal until the energy of the battery has been exhausted.

3,825,834
DIGITAL SSB TRANSMITTER

Richard Stuart, and Arvind M. Bhopale, both of Belts, Md., assignors to Rixon Eleronics, Inc., Silver Spring, Md.

Filed July 5, 1972, Ser. No. 269,047
Int. Cl. H04b 1/02
U.S. Cl. 325—137 4 Claims

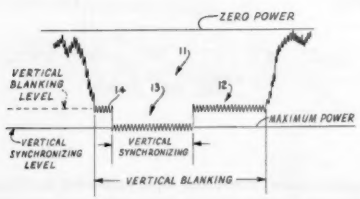


A digital single sideband transmitter for data modems including a digital filter which shapes the incoming binary data into two outputs in the form of equally delayed Inverse Fourier and Hilbert transforms of a near ideal lowpass filter. These outputs are respectively multiplied in analog multipliers by inphase and quadrature components of the carrier as produced by a sine-cosine generator. The outputs of the multipliers are then summed to produce a modulated single sideband signal. The digital filter serves to delay, truncate and shape the response using a shaping or window function of the general form $K_0 - K_1 \cos[(\pi/T)t]$ where K_0 and K_1 are constants and the function exists for the truncated period $t = 0$ to $2T$.

3,825,835
SIGNAL-TO-NOISE RATIO MEASUREMENT

Robert L. Hammett, Burlingame; Ronald H. Todd, Los Altos, and Lawrence W. Templeton, Menlo Park, all of Calif., assignors to Hammett & Edison, San Francisco, Calif.

Filed Sept. 16, 1971, Ser. No. 180,981
Int. Cl. G01r 19/10; H04b 1/00
U.S. Cl. 325—363 6 Claims

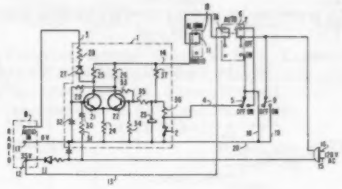


System and apparatus for the measurement of signal-to-noise ratio in electrical signals. An adjustable meter is set to the signal level or known fraction thereof and a square wave is added to the signal for display on an oscilloscope. A pair of vertically displaced oscilloscope traces, both containing the signal and the noise, are displayed and the square wave amplitude is adjusted to move the traces into contiguous or tangent relationship. The measured adjusted square wave amplitude is the signal-to-noise ratio of the electrical signal.

3,825,836
DELAYED ALARM AND DROWSE FOR CLOCK RECEIVERS

Gerald Dee Pyles, Marion, Ind., assignor to RCA Corporation, New York, N.Y.

Filed July 3, 1972, Ser. No. 268,787
Claims priority, application Great Britain, July 5, 1971, 31464/71
Int. Cl. H04b 1/16
U.S. Cl. 325—396 6 Claims



A timed full alarm condition is delayed for a short period of subdued alarm, by connecting the timer output through a modified Schmidt trigger circuit to the full-alarm generator. At the same time the timer output is connected to the subdued alarm generator, without a delay mechanism.

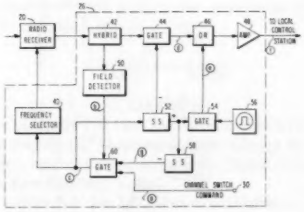
The delay feature is given by combining a charging circuit in the Schmidt triggering scheme. A transistor of the Schmidt circuit is used for analog processing of an alarm buzz tone signal as well as for outputting the trigger impulse. A renewed delay can be manually introduced by discharging the charging circuit without restoration of the timed switch to its quiescent condition. Recharging then commences a second cycle of delay with subdued alarm, then a repeated full-alarm.

The invention is embodied in a clock radio, where personal subdued alarm is the radio playing, and the full alarm is amplified clipped line waveform reproduced as a buzz on the radio loudspeaker. The discharge switch gives a drowse facility, again with radio.

3,825,837
TELEVISION RADIO FREQUENCY SWITCH

Robert David Briskman, Bethesda, Md., assignor to Communications Satellite Corporation, Washington, D.C.

Filed June 1, 1972, Ser. No. 258,694
Int. Cl. H04b 1/06; H04n 5/44
U.S. Cl. 325—456 8 Claims

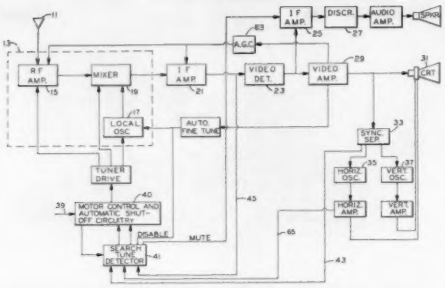


In a satellite ground station adapted to receive a plurality of television channels arriving, respectively, on different frequency carriers, a separate tuneable receiver is provided for each control center which is served by the ground station. When the tuneable receiver is switched in frequency, the first field sync pulse following receipt of a switching signal initiates a blank field which is placed at a d.c. level corresponding to the black level of the television picture. The succeeding field will be a complete field of the T.V. signal on the switched frequency.

3,825,838
SEARCH TUNE DETECTOR CIRCUIT

Louis F. Mayle, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed Aug. 3, 1972, Ser. No. 277,550
Int. Cl. H04b 1/34
U.S. Cl. 325—470 7 Claims

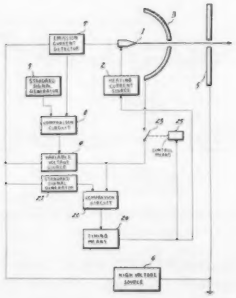


An improved circuit for indicating the tuning of a heterodyne television receiver to an active station and for providing an output signal indicative thereof is disclosed. The circuit employs a tuned circuit resonant at an intermediate frequency of the receiver for sensing proper tuning but allows this resonant circuit to sense only during the concurrence of flyback and synchronizing signals. A Darlington pair senses resonance in the resonant circuit and provides a search tune stop signal when that resonance occurs. The Darlington pair also functions to cause inhibition of the receiver audio signal during search tuning and to prevent resonance in the tuned circuit at times other than during search tuning.

3,825,839
CONSTANT CURRENT FIELD EMISSION ELECTRON GUN

Teruo Someya; Nobuyuki Kobayshi, and Toshinori Goto, all of Tokyo, Japan, assignors to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 19, 1972, Ser. No. 245,328
Claims priority, application Japan, Apr. 30, 1971, 46-28753; Japan, July 12, 1971, 46-51610
Int. Cl. H01j 29/46; H02h 7/00, 9/02
U.S. Cl. 328—9 6 Claims

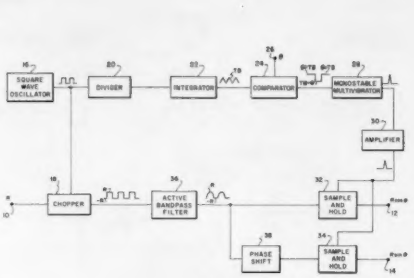


An improved field emission type electron gun is automatically controlled so as to generate a stable emission current. The preferred embodiment employs a detecting means for detecting the emission current fluctuation and a control means for controlling the electric field for field emission according to the output signal of said detecting means.

3,825,840
SOLID STATE RESOLVER

Henry P. Bell, Laurel, and William H. Licata, Adelphi, both of Md., assignors to the United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 10, 1973, Ser. No. 349,873
Int. Cl. H03k 5/08
U.S. Cl. 328—28 4 Claims

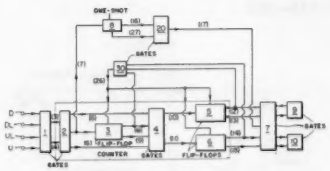


A solid state resolver to provide coordinate conversions in guidance systems. D.C. input signals of R and θ are supplied with the output of the resolver being R sin θ and R cos θ. A circuit comprising a field effect transistor is used to sample a sine wave of amplitude R to produce the desired output signals.

3,825,841
DIGITAL SYSTEM INCLUDING A PULSE COUNTER FOR SELECTIVELY INTERCONNECTING A SOURCE OF ENERGY AND A PLURALITY OF ENERGIZEABLE ELEMENTS

Richard A. Rappaport, Henrietta, N.Y., assignor to Sykron Corporation, Rochester, N.Y.

Continuation of Ser. No. 105,080, Jan. 8, 1971, abandoned, which is a division of Ser. No. 733,334, May 31, 1968, Pat. No. 3,555,381. This application Feb. 2, 1973, Ser. No. 329,080
Int. Cl. H03k 17/02
U.S. Cl. 328—70 7 Claims



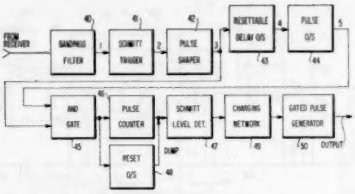
Digital circuitry converting input pulses into stepping motor winding energization pattern. Input pulses are converted by an up-down counter into sequence of pulse patterns corresponding to desired sequences of energization patterns, and produce gating pulses maintaining energization patterns between input pulses for only just such time as is needed to assure completion of motor steps. The counter is a flip-flop arrangement receiving input pulses from separate up and down input gates. The counter can produce more than the desired number of patterns, but production of undesired patterns makes the counter revert to a desired pattern. The stepping motor upon stepping to one of its limits disables the corresponding input gate, in effect.

3,825,842

PULSE RATE DISCRIMINATOR GENERATING OUTPUT ONLY AT PREDETERMINED INPUT FREQUENCY

Jerry Linward Birchfield, 2204 Tanglewood Rd., Decatur, Ga. 30033, and Richard Wallace Moss, 545 W. Sandtown Rd., Marietta, Ga. 30060

Division of Ser. No. 176,058, Aug. 30, 1971, Pat. No. 3,757,315. This application Apr. 18, 1973, Ser. No. 352,394
Int. Cl. H03k 9/06
U.S. Cl. 328—138 **13 Claims**



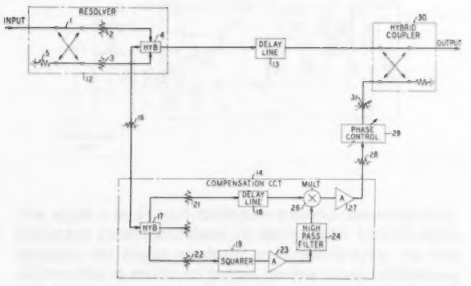
A pulse rate discriminator for generating an output signal only when the input signal thereto is of a predetermined frequency. A delay one-shot multivibrator means is connected to a pulse-generating means which generates first pulses timed with every other axis crossing of the input signal. The delay one-shot multivibrator means generates a delay pulse of preset duration which duration is a first predetermined fraction of the period corresponding to said predetermined frequency. A pulse one-shot multivibrator means is connected to the delay multivibrator means for generating second pulses the duration of which are a second predetermined fraction of the period corresponding to said predetermined frequency. An AND gate is connected to the pulse generating means and to the pulse one-shot multivibrator means for generating a coincidence signal each time the first and second pulses coincide and means is provided for detecting the coincidence signals and for generating the output signal only when a predetermined minimum number of the coincidence signals are detected.

3,825,843

SELECTIVE DISTORTION COMPENSATION CIRCUIT

Robert Irving Felsberg, and Hotze Miedema, both of Boxford, Mass., assignors to Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed June 8, 1973, Ser. No. 368,110
Int. Cl. H03b 1/04
U.S. Cl. 328—163 **5 Claims**



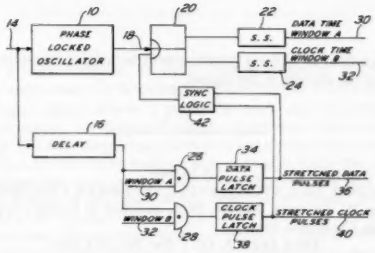
Nonlinear distortion in the transmission signal of a signal path is selectively compensated by the introduction of a distortion cancelling signal. A compensation circuit utilizes a portion of the transmission signal to generate the signal used in cancelling the distortion. In one embodiment of the compensation circuit, a squarer and a multiplier serve to produce a third order distortion cancelling signal. This distortion cancelling signal is then coupled to the signal path with its phase and amplitude individually adjusted to cause cancellation of the nonlinear distortion in the signal path. In an alternate embodiment of the compensation circuit, a balanced arrangement eliminates feedthrough of the transmission signal through the compensation circuit.

3,825,844

SYSTEM FOR RECOVERING PHASE SHIFTED DATA PULSES

Neil R. Peterman, Orange; Darryl K. Korn, Laguna Beach, both of Calif., and Stephen Millard, Phoenix, Ariz., assignors to Peripherals General, Inc., Cherry Hill, N.J.

Filed Oct. 18, 1972, Ser. No. 298,741
Int. Cl. H03d 3/18
U.S. Cl. 329—104 **7 Claims**



Apparatus for recovering data from a signal having data bits interleaved between clock pulses wherein the data pulses, clock pulses or both may be shifted. The signal from which data is to be recovered is applied to a phase locked oscillator. The phase locked oscillator produces a free running center frequency output signal having a frequency of twice the clock frequency. The frequency of the phase locked oscillator is varied in response to the shift in the pulses in the incoming signal. Data and clock time window signals are generated in response to the varying output frequency of the phase locked oscillator. The incoming signal is gated by a first and a second gating means during the data and clock time window signals, respectively. The signal may be delayed before being gated in order to insure sufficient time for the generation of the data and clock time window signals.

3,825,845

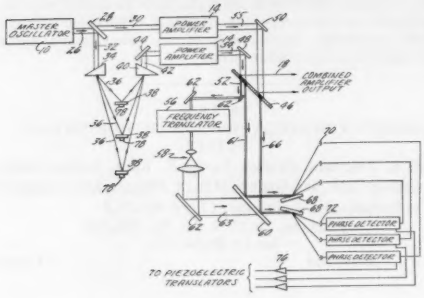
PARALLEL OPTICAL STAGE LASER SYSTEMS

Albert W. Angelbeck, Manchester, and George R. Wisner, Deep River, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Feb. 14, 1973, Ser. No. 332,946
Int. Cl. H01s 3/10
U.S. Cl. 330—4.3 **14 Claims**

Disclosed are laser amplifier systems for producing unlimited amounts of laser power having controllable frequencies and good optical qualities. A source of controllable frequency coherent energy is directed through a plurality of parallel optical channels, each of which contains laser power amplification means. The outputs from the parallel channels are combined spatially parallel to form a system component laser output having an aligned phase front. A sample beam is taken from each amplification channel and is processed with a phase sensitive optical detector to produce suitable error

signals which are used to vary the optical pathlengths of the system necessary to align the phase fronts. In addition, an au-



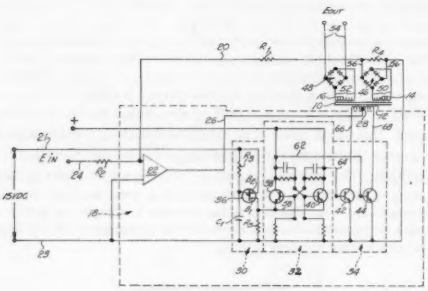
toalignment or a phase measurement technique maintains the spatial parallelism in the output.

3,825,846

SIGNAL ISOLATOR HAVING FEEDBACK CONTROL

James W. Grygera, Racine, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 23, 1973, Ser. No. 353,280
Int. Cl. H03f 3/38
U.S. Cl. 330—9 **4 Claims**



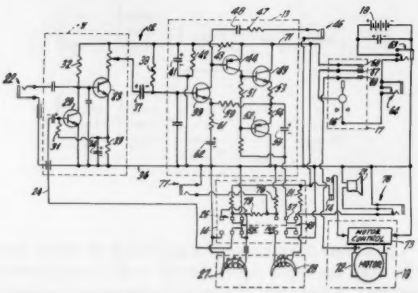
A control circuit is provided for electrically isolating an input circuit from an output circuit which is responsive to an input signal in the input circuit. A feedback signal indicative of the response of the output circuit is also provided to the input circuit to improve the controllability of the output circuit by the input circuit. This novel control circuit provides the signal indicative of output circuit response from a duplicating circuit which substantially duplicates the response of the output circuit to the input circuit signal. The output from the duplicating circuit is connected by a feedback loop to the input circuit to establish a control signal in the input circuit. This control signal assures an accurate response of the output circuit and the duplicating circuit to the input signal in the input circuit. The duplicating circuit is electrically isolated from the output circuit to maintain the electrical isolation between the input and output circuits.

3,825,847

AMPLIFIER SYSTEM

David C. Hughes, and Henry A. Sherwood, both of Short Hills, N.J., assignors to Lorraine Industries, Inc., Bridgeport, Conn.

Continuation of Ser. No. 95,466, Dec. 7, 1970. This application Dec. 13, 1972, Ser. No. 314,718
Int. Cl. H03f 3/18
U.S. Cl. 330—13 **3 Claims**



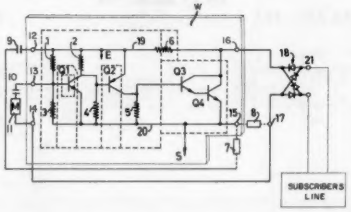
A cassette recorder amplifier system with a two stage preamplifier having direct current forward feed from the first to the second stage and direct current feedback from the second to the first stage to cause the second stage to operate without overloading as an input stage. The power amplifier has high direct current feedback and lower alternating current feedback for better linearity and more gain. Switch circuits and extra input terminals provide for recording on recording, aural monitoring of recording, and higher speed on fast forward and reverse.

3,825,848

INTEGRATED AMPLIFIER

Olaf Sternbeck, Bromma, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Dec. 18, 1972, Ser. No. 316,403
Claims priority, application Sweden, Jan. 5, 1972, 93/72
Int. Cl. H03f 3/18
U.S. Cl. 330—17 **7 Claims**



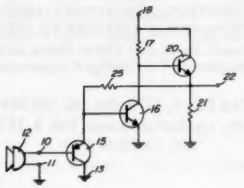
An integrated circuit preamplifier formed on a single substrate divided into regions by insulation frames connected with the microphone of a telephone subset via transistor preamplifier and transistor output amplifiers in different regions to the subscriber's line. The operating voltages for the amplifiers are received via a conductor which has a decoupling resistor between the points which supply the respective amplifiers, and the portion of such conductor connected to the output amplifier is connected via a decoupling capacitor to a reference potential point.

3,825,849

SMALL SIGNAL AMPLIFIER

Donald L. Linder, Elmhurst, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed July 12, 1972, Ser. No. 270,902
Int. Cl. H03f 3/18
U.S. Cl. 330—17 8 Claims



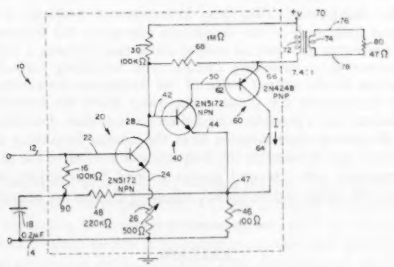
A transistor amplifier stage followed by an emitter follower stage with the emitter follower providing an output and feedback to the base of the amplifier stage and an opposite conductivity type transistor connected between the base and common. A microphone or other small signal generating device providing an AC or DC signal is connected between the base and common of the transistor so that the transistor operates as a variable conductivity diode with the conductivity varying in accordance with the small signal input. Thus the microphone is direct coupled to the amplifier and the small signal varies about the common or ground potential with the feedback maintaining the entire circuit at a desired operating point.

3,825,850

DIRECT-COUPLED AUDIO AMPLIFIER HAVING UNBYPASSED EMITTER RESISTOR STAGES

Kalju Meri, Maspeth, N.Y., assignor to Electrospace Corporation, Bronx, N.Y.

Filed Nov. 28, 1972, Ser. No. 310,028
Int. Cl. H03f 3/42
U.S. Cl. 330—19 14 Claims



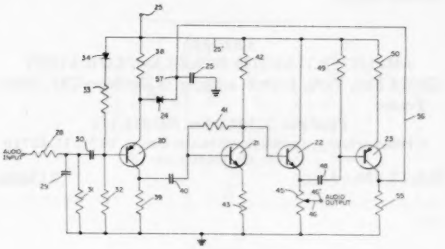
A single-ended high-voltage gain, direct-coupled audio amplifier has unbypassed emitter resistor stages. Two common-emitter NPN amplifying stages are followed by an inverted PNP emitter-follower output stage. The second amplifying stage has an unbypassed, low valued emitter resistor through which the collector current of the output stage passes to develop sufficient bias on the emitter of the second stage. Decoupled DC feedback is provided between the unbypassed resistor and the input base of the first amplifying stage.

3,825,851

AUDIO THRESHOLD LEVELER WITH NOISE LEVEL SUPPRESSOR

John F. Smith, Warminster, Pa., assignor to Narco Scientific Industries, Inc., Fort Washington, Pa.

Continuation of Ser. No. 218,986, Jan. 19, 1972, abandoned.
This application Aug. 6, 1973, Ser. No. 385,729
Int. Cl. H03g 3/30
U.S. Cl. 330—29 6 Claims



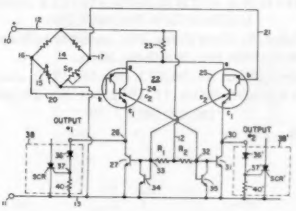
In a radio receiver, an audio threshold leveler and noise level suppressor, for keeping the audio output level constant for input signals above a threshold level, and providing no signal output for detected audio inputs less than receiver noise. The first stage employs in its input a diode connected to conduct at low input audio levels so that it holds the active device of the stage at a low gain point of operation, and to be back biased as the input audio signal is increased, thereby causing AC degeneration which counteracts the increasing device gain. The output from the first stage is coupled through cascaded amplifier stages to a peak detector which derives a signal representative of the input audio level, which signal is connected to and biases the first stage diode so as to achieve the desired circuit response.

3,825,852

CONTROL SYSTEM COMPRISING DIFFERENTIAL AMPLIFIER WITH DUAL CURRENT COMPARATOR HAVING TWO OUTPUTS SEPARATED BY A DEADBAND

B. Hubert Pinckaers, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 5, 1972, Ser. No. 295,398
Int. Cl. H03f 3/68
U.S. Cl. 330—30 D 7 Claims



A condition responsive circuit, disclosed as an automatic changeover heat-cool solid state thermostat, is adapted to be connected by three terminals to one or the other alternating current load and to a source of alternating current potential. The solid state condition responsive system uses an improved differential amplifier with dual current comparators and has two outputs separated by a deadband. The differential amplifier and the two current comparators control the firing of a silicon controlled rectifier in the first or second outputs when

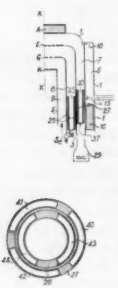
there is a need to energize one or the other load. The AC supply voltage to the condition responsive system amplifier and current comparators is shorted out early in each half cycle by a four layer diode across the input of the condition responsive circuit. This arrangement allows for switching to a relatively high impedance within the condition responsive circuit to virtually eliminate the power dissipation therein except during the initial portion of each applied waveform and thus also insures that switching of the silicon controlled rectifiers and triacs only occurs near the voltage crossover of the alternating current supply.

3,825,853

AMPLIFIER TUBE FOR POWER AMPLIFICATION

Gerard Sire, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 1, 1972, Ser. No. 311,151
Claims priority, application France, Dec. 6, 1971, 71.43710
Int. Cl. H03f 3/60
U.S. Cl. 330—53 **2 Claims**



An amplifier tube for power amplification comprises a protection device against self-oscillation of the kind which develop in a cavity of the amplifier tube.

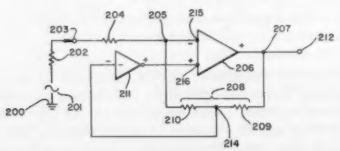
This device comprises waveguides coupled at one end to this cavity and having such cross-section dimensions that they form short-circuits at the frequencies of operation of the amplifier tube and act as a trap at the frequency of the self-oscillation. The guides may be located outside the cavity, if the location thereof makes this possible; they may also be provided in the plunger of the cavity.

3,825,854

AMPLIFIER WITH SUBSTANTIALLY ZERO DISTORTION PRODUCTS

Henri T. Pichal, St. Petersburg, Fla., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Continuation of Ser. No. 96,803, Dec. 10, 1970, abandoned.
This application Oct. 11, 1972, Ser. No. 296,693
Int. Cl. H03f 1/26
U.S. Cl. 330—149 **8 Claims**



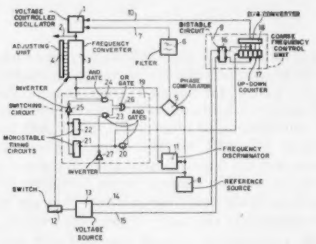
An amplifier with substantially zero distortion products is disclosed. A circuit is provided that independently compares the signals in the amplifier output with all the signals provided by the amplifier input source and discriminates between the original signals (fundamentals) and non-original signals (distortion product, spurious signals, and noise, etc.) present in the output terminals of the amplifier or network. Having discriminated and isolated the nonoriginal signals these are then re-inserted back into the amplifier in such phase that provides cancellation of the internally generated products.

3,825,855

FREQUENCY SYNTHESIZER WITH COARSE STAIRSTEP FREQUENCY CONTROL AND FINE PHASE CONTROL

Jean-Claude Basset, Paris, and Pierre Heins, Argenteuil, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 6, 1973, Ser. No. 330,005
Claims priority, application France, Feb. 8, 1972, 72.04105
Int. Cl. H03b 3/04
U.S. Cl. 331—1 A **9 Claims**



The output frequency of a voltage controlled oscillator is phase and frequency locked to the frequency of a reference source through a frequency converter. The frequency converter divides the voltage controlled oscillator frequency by an adjustable division ratio and applies the divided frequency to both a phase comparator and a frequency discriminator. A coarse frequency control unit applies an output of the frequency discriminator to the voltage controlled oscillator as a stepwise adjustable coarse frequency control signal. The phase comparator output provides a fine control signal to the voltage control oscillator. In response to an adjustment of the frequency converter to a new division ratio a two position switch sets the counting direction of an up-down counter in the coarse frequency control unit in accordance with the sense of the change in division ratio. In response to a change in the output frequency of the frequency converter the frequency discriminator provides an output pulse that initiates a timing sequence in a switching circuit. The switching circuit in response to the output pulse of the frequency discriminator first disconnects the phase comparator from the frequency converter for a predetermined time period, then disconnects the frequency discriminator from the coarse frequency control unit and reconnects the frequency converter to the phase comparator for a second predetermined time period, after which the phase and frequency adjusting circuits are restored.

3,825,856

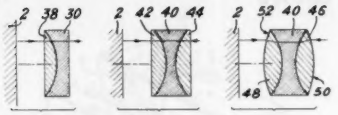
LASER GENERATOR FOR SINGLE TRANSVERSE MODE OPERATION

Jacques Pezot, Marcoussis, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 7, 1972, Ser. No. 313,186
Claims priority, application France, Dec. 10, 1971, 71.44398
Int. Cl. H01s 3/05
U.S. Cl. 331—94.5 C **6 Claims**

A laser generator which oscillates in a single transverse mode comprises an amplifying medium placed within a resonator consisting of two oppositely facing mirrors.

Provision is made within the resonator for an optical system of revolution having an axis which is adjacent to the resonator



axis and comprising a divergent lens of homogeneous absorbent material.

3,825,857

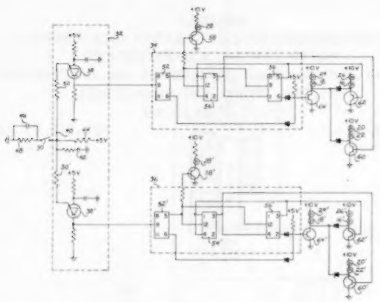
SIMULATED DICE GAME AND CONTROL CIRCUIT THEREFOR

Dennis D. Dice, Yadkinville, N.C., assignor to Electronic Data Controls Corporation, Winston-Salem, N.C.

Division of Ser. No. 253,057, May 15, 1972. This application Aug. 8, 1973, Ser. No. 386,730

Int. Cl. H03k *3/82*

U.S. Cl. 331—111 **2 Claims**



A simulated dice game including a playing board on which is presented a display including lamps arranged in a pattern corresponding to the spot patterns on two dice. A manually operated switch button is provided to activate and deactivate pulse generating devices for each lamp arrangement, and the generated pulses are fed to counter circuits that are switched through a predetermined recurring sequence of operating states which selectively energize the lamps through output circuitry to show combinations of one to six lamps on each die. The pulse generating device produces triggering pulses at a relatively low frequency and at a constant repetition rate during activation thereof by the switch button and produces such pulses at a descending repetition rate upon deactivation thereof by the switch button whereby the lamps flash visibly during activation and continue to flash at a descending repetition rate upon deactivation until a final operating state is displayed upon cessation of pulse generation.

3,825,858

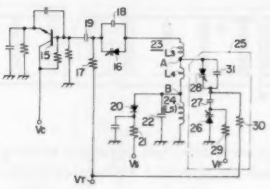
LOCAL OSCILLATOR FOR USE IN A VHF TUNER FOR A TELEVISION RECEIVER

Kiyoshi Amemiya; Masakazu Kondou, both of Yokohama; Kazuhiko Yamazaki, Fujisawa, and Fumio Kanai, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 23, 1973, Ser. No. 335,139

Int. Cl. H03b *3/04, 5/12*

U.S. Cl. 331—117 R **2 Claims**



A local oscillator for a VHF tuner employing variable capacitance diodes in which a high band tuning coil is tapped at a suitable point and an AFC circuit is connected to this point so as to eliminate variations of the AFC sensitivity depending on the high and low bands. Further, a variable capacitance diode is connected in series with the AFC circuit and tuning voltage is applied to this variable capacitance diode so as to eliminate variations of the AFC sensitivity depending on the channel.

3,825,859

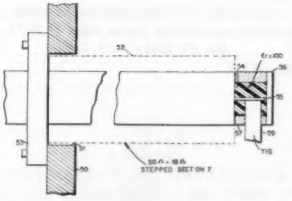
MINIMUM INSERTION LOSS YIG PULSE COMPRESSION FILTER TRANSDUCER

Gerald I. Klein, Westbury, N.Y.; Robert A. Moore, Severna Park, and Stephen F. Payer, Glen Burnie, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 80,390, Oct. 30, 1970, abandoned, which is a continuation of Ser. No. 809,672, March 24, 1969, abandoned. This application May 25, 1972, Ser. No. 257,052

Int. Cl. H03h *9/30, 9/34*

U.S. Cl. 333—30 M **3 Claims**



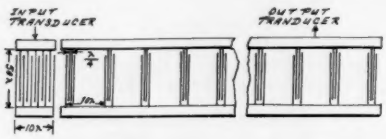
The present invention relates generally to a broad band delay line utilizing magnetoelastic coupling and propagation of acoustic waves. Microwave pulse compression is effected by an axially magnetized YIG rod. The YIG rod performs the function of a wide band dispersive delay line having a monotonically increasing delay versus frequency characteristic. Pulse compression is effected by differentially delaying the successive instantaneous frequency components of a swept input pulse. Insertion loss is maintained less than 20 db from 1.0 to 3.0 GHz and as low as 7 db.

3,825,860

SURFACE WAVE DELAY LINE WITH QUARTER-WAVE TAPS

Paul H. Carr, Bedford, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 13, 1972, Ser. No. 314,638
Int. Cl. H03h 9/26, 9/30; H01v 7/00
U.S. Cl. 333—30 R 3 Claims



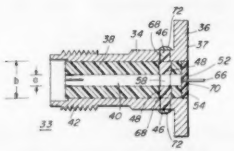
A surface wave delay line apparatus utilizing quarter-wave taps in a multiply tapped Li NbO_3 delay line to reduce reflections.

3,825,861

COAXIAL LINE TO STRIP LINE CONNECTOR

John R. O' Donnell, Ashland, Mass., assignor to EG & G, Inc., Bedford, Mass.

Filed Sept. 10, 1973, Ser. No. 395,486
Int. Cl. H01p 5/08
U.S. Cl. 333—33 3 Claims



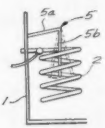
A connector for coupling a coaxial cable and a strip line having compensating material in the launch area disposed in a slot extending diametrically across the face of a member that insulates a connecting rectangular tab from the connector body.

3,825,862

HELICAL RESONATOR

Yasumi Koizumi, Tokyo, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Sept. 7, 1973, Ser. No. 395,462
Claims priority, application Japan, Nov. 1, 1972, 47-12541
Int. Cl. H01p 7/06, 7/04
U.S. Cl. 333—83 R 5 Claims



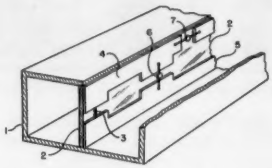
A resonator comprises a metal housing, a helical coil disposed inside the housing, and means for adjusting the resonant frequency of the coil. The adjustment means takes the form of a generally L-shaped metallic strip having a first portion secured to the housing and a second portion extending into the interior of the coil. The position of the second portion is changeable relative to the coil turns to adjust the resonant frequency of the coil.

3,825,863

MICROWAVE TRANSMISSION LINE

Paul J. Meier, Westbury, N.Y., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed May 18, 1973, Ser. No. 361,634
Int. Cl. H01p 3/12, 1/00
U.S. Cl. 333—95 R 7 Claims



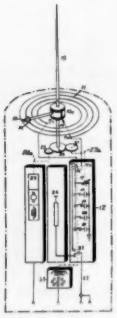
A microwave transmission structure consisting of a hollow conductive waveguide with at least one film conductor supported on a dielectric substrate within the guide to provide a conductive surface projecting inwardly from the guide wall in the manner of a ridge in ridgeguide.

3,825,864

AERIAL TUNING DEVICE

Sven Ramstrom, Lyckeby, Sweden, assignor to Karlskronavarvet AB, Karlskrona, Sweden

Continuation of Ser. No. 177,369, Sept. 2, 1971, abandoned.
This application June 25, 1973, Ser. No. 373,099
Int. Cl. H03j 5/00; H03h 7/38
U.S. Cl. 334—39 2 Claims



An aerial tuning device comprising a coil and a capacitor having variable inductance and capacitance, respectively, said coil being connected in series with the aerial and also connected to the capacitor. The coil is provided with a movable contact, and the capacitor has a continuously rotating adjustment shaft, said shaft being operatively linked with said movable contact, so that the shaft is rotated at the same time as the contact of the coil is moved. Thus, during the movement of the coil contact, the capacitance of the capacitor varies up and down between a minimum value and a maximum value.

3,825,865

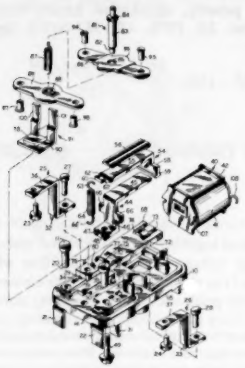
ELECTROMAGNETIC RELAY

Robert E. Prouty, and Robert E. Graf, both of Logansport, Ind., assignors to Essex International Inc., Fort Wayne, Ind.

Filed May 11, 1973, Ser. No. 359,613
Int. Cl. H01h 51/06
U.S. Cl. 335—128 2 Claims

An electromagnetic relay having an electromagnetic coil, frame and a pivotable armature. The frame is a generally C-

shaped magnetizable member. One end of the frame is enlarged to increase air gap area while an armature is pivoted on the other end of the frame. A contact assembly connected



directly to the armature provides for normally closed as well as normally open contacts and includes a post connected to the armature as well as contact carrying arms which slide on the post.

3,825,866

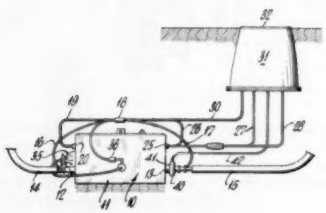
SYSTEM AND APPARATUS FOR UNDERGROUND TRANSFORMER INSTALLATION

Nicholas E. Piccione, 28 Stengel Pl., Smithtown, N.Y. 11787

Filed June 29, 1972, Ser. No. 267,275

Int. Cl. H01h *71/20*

U.S. Cl. 337—17 **3 Claims**



In an underground distribution transformer system the tank of the transformer is connected to a protective grounded anode, and is connected to the system neutral only by way of a voltage responsive shunt bypass. The shunt bypass is comprised of an encapsulated device including a lead disk connected to one terminal thereof and separated from another lead disk connected to the other terminal thereof by a Mylar disk having a central aperture. Spring loading is provided in the device for urging the lead disks together when they are melted due to arc-over currents in the gap defined by the Mylar disk.

3,825,867

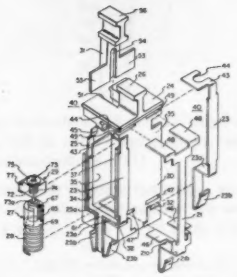
ELECTRICAL PROTECTORS AND METHODS OF ASSEMBLING THE SAME

Thomas Georgopulos, Chicago, Ill., assignor to GTE Automatic Electric Laboratories, Incorporated, Northlake, Ill.

Continuation-in-part of Ser. No. 245,462, April 19, 1972, abandoned. This application Mar. 19, 1973, Ser. No. 342,662

Int. Cl. H01h *39/00*

U.S. Cl. 337—32 **18 Claims**



Electrical protectors useful for protecting incoming line pairs in telephone main distributing frames including a pair of protector assemblies of redundant nature encased within common housing means. Each protector assembly includes two separate grounding paths through the provision of two spaced grounding contacts, circuit protective means for selectively providing at least one of the grounding paths, and first and second circuit contact means for providing a normal circuit current path through the assembly. Spring means, employed to maintain relative positions of assembly parts, are positioned between one grounding contact and the circuit protective means and comprise a portion of a first grounding path for the assembly. A projectible pin element is urged by the spring means toward direct engagement with the other grounding contact to establish a second grounding path for the protector assembly under particular circuit fault conditions. In one practice, current limiting means constitutes a portion of the normal circuit current path. In another practice, the normal circuit current path by-passes all parts of the circuit protective means. Circuit interruptive means are provided to remove a selected one of the circuit contact means from the normal current path to provide a detent position for the protector assembly.

3,825,868

THERMALLY RESPONSIVE SWITCH

Thurman S. Jess, Mundelien, Ill., and Wilbur F. Jackson, Rolling Hills, Calif., assignors to Robertshaw Controls Company, Richmond, Va.

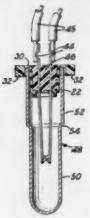
Continuation of Ser. No. 116,185, Feb. 17, 1971, abandoned. This application Jan. 15, 1973, Ser. No. 323,616

Int. Cl. H01h *45/02*

U.S. Cl. 337—112 **9 Claims**

A thermally responsive switch and method for making the same in which a pair of contact elements including at least one bimetallic element are mounted within an integral support base molded from a mass of thermosetting material which is cured at the desired operating temperature for the switch. The contact elements each have a protruding stop and are biased

during manufacture such that the stops abut the support base while the contact ends are maintained in a predetermined



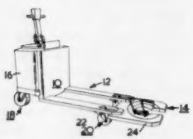
relationship with each other whereby the switch is calibrated at the same time the thermosetting material is cured.

3,825,869

AIRCRAFT GROUND HANDLING EQUIPMENT

Francis B. Loomis, Brockville, Ontario, Canada, assignor to The St. Lawrence Engine Co. Limited, Brockville, Ontario, Canada

Filed July 11, 1973, Ser. No. 378,202
Claims priority, application Canada, Apr. 12, 1973, 168532
Int. Cl. B60b *29/00*
U.S. Cl. 214—331 **8 Claims**



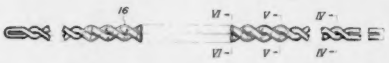
This relates to aircraft ground handling apparatus including a base member having an opening therein and an entry-way extending from a peripheral portion of the base member to said opening. An aircraft wheel engaging element is mounted on the base member in the region of the opening in the base member for rotation relative thereto about a generally vertical axis. The rotatable element has an entry-way therein leading into a free or open central region therein and arranged such that when said element is rotated to bring the entry-way thereof into general alignment with the entry-way in the base member, the base member may be advanced at a low level toward a wheel of an aircraft such that said wheel enters through said aligned entry-ways into the central region of said wheel engaging element. Means are provided for applying a torque to said element to rotate same through a selected angle relative to the base member. The wheel engaging element is sized and arranged to engage peripheral portions of the aircraft wheel to apply lifting forces to same when said base member is lifted after said element has been rotated through said selected angle relative to the base member.

3,825,870

FUSE ELEMENT AND A HIGH VOLTAGE CURRENT-LIMITING FUSE

Yoshio Ono; Chiu Sekine, both of Nagoya; Naotoshi Takaoka, and Nobuyoshi Asai, both of Inuyama, all of Japan, assignors to Takamatsu Electric Works Ltd., Inuyama, Japan

Filed Nov. 5, 1971, Ser. No. 196,039
Claims priority, application Japan, Nov. 11, 1970, 45-99578; Dec. 25, 1970, 45-135349[U]; Sept. 2, 1971, 46-67620
Int. Cl. H01h *85/04*
U.S. Cl. 337—159 **15 Claims**



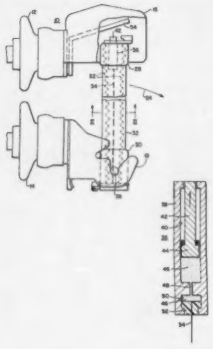
A fuse element essentially consisting of a plurality of fuse wires twisted together and press rolled under the twisted state and a high voltage current-limiting fuse which comprises at least one of the above mentioned fuse elements wound spirally with a given pitch around an insulating core embedded in an arc quenching filler within an insulating tube closed at the ends thereof by external and internal electrodes connected to the ends of the fuse element. The presence of the fuse wires twisted together and rolled under the twisted state makes it possible to refrain the overvoltage from sudden rising in a positive manner. The fuse element with a low melting point alloy portion incorporated therein and assembled within a Teflon sleeve is capable of reliably interrupting the full-range of fault currents.

3,825,871

ELECTRIC FUSE WITH TRIP DEVICE

Donald D. Blewitt, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 20, 1973, Ser. No. 417,693
Int. Cl. H01h *71/20*
U.S. Cl. 337—171 **9 Claims**



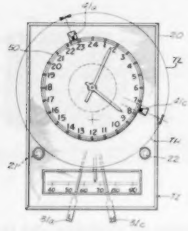
A current limiting fuse structure characterized by a tubular, electrically insulating casing having spaced terminals thereon, one end of the casing being pivotally mounted on first terminal means and the other end of the casing being releasably mounted on second terminal means, a first fusible element within the casing and extending between the spaced terminals, trip means for unlatching the other end of the casing and comprising a plunger and a delayed explosive charge for driving the plunger against the second terminal means for releasing the other end of the casing from a second terminal means upon ignition of the delayed explosive charge, and a second fusible element extending between the terminal at said one end of the casing and the delayed explosive charge.

3,825,872

CLOCK CONTROLLED THERMOSTAT

Keith A. Sadler, 1505 Del Gado Dr., Sherman Oaks, Calif. 91403, and Ralph E. Phillips, Jr., 9154 Janice Pl., Beverly Hills, Calif.

Filed June 4, 1973, Ser. No. 366,584
Int. Cl. H01h 37/00
U.S. Cl. 337—301 6 Claims



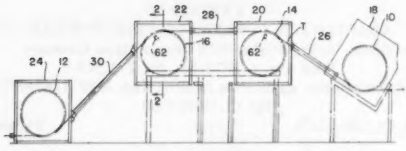
A clock controlled thermostat in which the clock does not require a separate source of power but is energized from the same source as the remaining circuitry of the thermostat.

3,825,873

CONTACT WHEEL ASSEMBLY FOR STRAND ANNEALING TUBING

James L. Herren, Decatur, Ala., and Edward P. Habdas, Dearborn, Mich., assignors to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 18,882, March 12, 1970, abandoned, which is a division of Ser. No. 706,589, Feb. 19, 1968, Pat. No. 3,518,405. This application Mar. 21, 1972, Ser. No. 236,759
Int. Cl. H01r 39/46
U.S. Cl. 339—8 R 10 Claims



A contact wheel assembly for use in conducting current to or from copper tubing engaged with the wheel. The wheel is peripherally grooved to receive advancing tubing and sparking is substantially eliminated by forming the tube contacting portion thereof of electrographitic material.

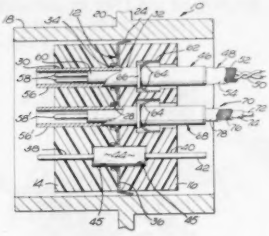
3,825,874

ELECTRICAL CONNECTOR

William J. Peverill, San Clemente, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed July 5, 1973, Ser. No. 376,884
Int. Cl. H01r 3/06
U.S. Cl. 339—14 R 5 Claims

An electrical connector with an internal grounding foil for grounding outer conductors of multi-conductor cables. The invention is particularly suited for Twinax cables in which the shields are grounded to the connector shell by the grounding foil to preclude or minimize the transmission of electromagnetic pulses (EMP) through the connector. The connector



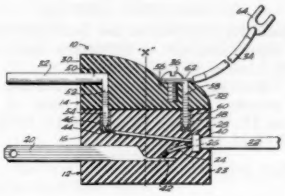
also houses pin contacts which may be either insulated from the grounding foil or carry filter elements which attenuate radio frequency interference (RFI).

3,825,875

ELECTRICAL PLUG WITH SELECTABLE GROUNDING TERMINALS

Lewis B. Garrett, 1020 W. 47th St., Hialeah, Fla. 33012

Filed Nov. 12, 1973, Ser. No. 415,144
Int. Cl. H01r 3/06
U.S. Cl. 339—14 RP 13 Claims



An electric plug for connecting a three-wire electrical system to a three-prong or two-prong electric receptacle comprising, generally, a plug having the conventional two current-carrying prongs and a top portion, manually adjustable, to present a third, ground prong, for reception in a conventional three-prong receptacle or a pigtail for connection to the conventional metal wall box of a two-prong receptacle. The top portion is manually adjustable in a manner whereby either the ground prong or the pigtail is disposed in electrical connection with the third, ground wire, in the wire cable to the plug while the grounding terminal not in use is disconnected therefrom.

3,825,876

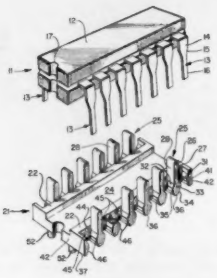
ELECTRICAL COMPONENT MOUNTING

Neil F. Damon, Cumberland, R.I.; Robert S. Laurence, Attleboro, and Ralph C. Hoy, East Falmouth, both of Mass., assignors to Augat Inc., Attleboro, Mass.

Filed Aug. 12, 1971, Ser. No. 171,217
Int. Cl. H05k 3/32
U.S. Cl. 339—17 CF 10 Claims

An electronic component mounting system particularly adapted for the economical high density packaging of integrated circuits selectively in readily removable or soldered permanent attachment. Each integrated circuit component is rigidly attached to a complementary cartridge of insulated material and the assembled structure may be inserted in either normal or inverted position within terminals correspondingly arrayed on a mounting panel. In one position the assembly may be plugged in and snapped out as required, while in in-

verted position the individual leads of the integrated circuit may be soldered to respective terminals. Each of the mounting panel terminals is provided with a wire wrapping pin extension



and the spacing of the pins remains as in prior systems, enabling the use of existing wire wrap programs without change.

3,825,877

PRINTED CIRCUIT ASSEMBLY AND METHOD FOR FABRICATION THEREOF

Tadato Ojima; Kazuhiro Koiso, and Toshihiko Nakano, all of Osaka, Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed May 31, 1972, Ser. No. 258,336

Claims priority, application Japan, May 31, 1972, 46-37952; June 15, 1971, 46-51266; June 15, 1971, 46-51267; June 16, 1971, 46-51949

Int. Cl. H05k *1/04*

U.S. Cl. 339—17 C **7 Claims**

A printed circuit assembly is herein proposed which has a multiplicity of generally L-shaped external terminal elements each of which is connected at one end to a printed circuit on the printed base panel through a soldered joint and which is formed at the other with a plug portion which is to be inserted into a plug socket. The plug portion projects usually perpendicularly from the printed base panel and extends on the same side as the joints on the base panel. The joints on the base panel are therefore soldered in a single dip-soldering operation in which the plug portions of the external terminal elements are kept intact with the result that no changes in size and configuration are invited as a result of the dip-soldering operation. The external terminal elements are thus readily inserted into the plug socket and are prevented from being dislocated or deformed when the plug socket is connected to or disconnected from the group of the terminal elements. The assembly may further include retaining means for securely holding the terminal elements in position relative to the printed base panel.

3,825,878

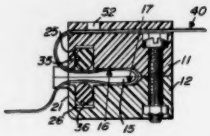
FLEXIBLE FLAT CABLE SYSTEM

Carl Finger, Glenview, and John W. Pausche, Norridge, both of Ill., assignors to Motorola, Inc., Chicago, Ill.

Filed Sept. 10, 1973, Ser. No. 395,475

Int. Cl. H05k *1/07*

U.S. Cl. 339—17 F **5 Claims**



A housing having an elongated slot therein with opposed parallel channels in the upper and lower surfaces adjacent the opening of the slot and parallel spaced apart ridges extending transverse to the longitudinal axis of the channels in the bottom surface of each of the channels. An elongated cylindrical, silicone rubber member having a diameter slightly larger than the width and depth of the channels positioned in each of the channels so as to extend slightly into the slot and a flexible flat cable having a fold therein transverse to the parallel conductors and positioned in the slot between the resilient members with each conductor parallel to and overlying a ridge in the adjacent channel. Said cable further defining openings between the conductors positioned in overlying relationship to the resilient members and a portion of the cable folded back over the housing and fixed in position by a strip of plastic having openings therethrough to provide test point access to the conductors.

3,825,879

ADAPTER FOR CURRENT DISTRIBUTOR RAIL

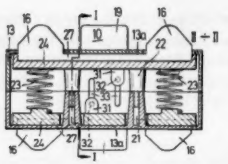
Kurt Hesse, 38, Waterfohr, 4920 Lemgo-Lippe, Germany

Filed Aug. 2, 1972, Ser. No. 277,303

Claims priority, application Austria, Aug. 3, 1971, 6789/71

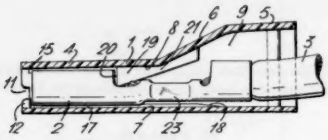
Int. Cl. H01r *9/00*

U.S. Cl. 339—21 R **3 Claims**



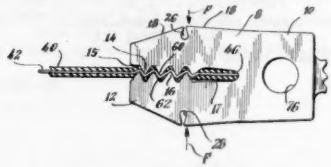
An adapter for joining two current distributor rails together, or supplying or tapping current to or from a rail, comprises a two-part insulating housing, a pair at least of contact assemblies spring-loaded to extend retractable contacts through slots in opposite sides of the housing so as to engage current carrying conductors in the rail(s), when in use, an earthing plate on the housing located to first engage an earthing conductor when the adapter is inserted into a rail, and locking lugs on the adapter to engage slots in the rail.

3,825,880
ELECTRICAL CONNECTOR HOUSING
Dino Battaglia; Mario Bergonzi; Wladimiro Teagno, and Franco Trevisiol, all of Turin, Italy, assignors to AMP Incorporated, Harrisburg, Pa.
Filed Dec. 15, 1972, Ser. No. 315,400
Claims priority, application Italy, Dec. 22, 1971, 32799/71
Int. Cl. H01r *9/16*
U.S. Cl. 339—59 R **5 Claims**



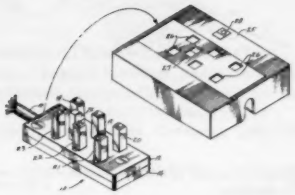
An electrical connector housing comprising a tubular body of resilient insulation material internally formed with an integral detent presenting a forward facing shoulder and with a stop for limiting forward movement of an inserted contact receptacle, at least a portion of the body being of generally rectangular cross-section, is characterized according to the present invention in that, the detent extends across a corner of the portion of rectangular cross-section, and presents a forward facing shoulder of triangular cross-section and a rear surface inclined rearwardly, outwardly and between the adjacent walls of the portion of rectangular cross-section.

3,825,881
TERMINATION DEVICE FOR FLAT ELECTRICAL CONDUCTORS
Jon Wigby, Sandy Hook, Conn., assignor to Burndy Corporation, Norwalk, Conn.
Filed Dec. 29, 1972, Ser. No. 319,143
Int. Cl. H01r *11/20*
U.S. Cl. 339—97 R **6 Claims**



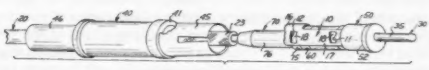
An electrical contact element for gripping and providing electrical contact with a flat conductor includes an integral, bifurcated-shaped segment having a pair of jaw members each of which include teeth formed along inner edges of the jaws. Outer jaw edges extend to an apex along a length thereof. A slot is formed in each jaw at the apex and extends generally inwardly from the apex. The apex is positioned along the length of the jaw at a location for providing that upon the application of a crimping force to the element at the apex, the element will deform near the slot and grip a conductor positioned between the jaws with a force which decreases progressively along the length of the jaw from inner to outer teeth. Deformation of the element results in the establishment of creep resisting forces which lock the jaws to the cable.

3,825,882
CORD ADAPTER FOR TELEPHONES
Council A. Tucker, Los Angeles, Calif., assignor to American Telecommunications Corporation, El Monte, Calif.
Filed Oct. 19, 1972, Ser. No. 299,180
Int. Cl. H01r *13/58, 13/54*
U.S. Cl. 339—103 R **11 Claims**



A cord adapter has a plurality of male plug stabs to establish electrical contact with a cooperating contact in a plug receptacle or jack. Each plug stab is comprised of a post extending upwardly from the base of the adapter and receiving a blade of a contact with the end of the blade staked to the post at the top thereof. The vertical portion of the blade faces laterally outward. Spade terminals of the cord are adapted to be received in spade terminal receptacles within the base and engage additional blades of the contacts. The spades are bent at right angles so that their shanks are received in troughs of the adapter's contact mounts to keep individual spades from touching other spades and to present a low vertical profile in the cord adapter. The cord itself is secured within the adapter either by a T-type connection or a fixed loop connection. A catch for a latch extends from the base on the plug stab side for latching engagement in the female plug receptacle.

3,825,883
COAXIAL CABLE CONTACT
Valentine J. Hemmer, Sidney, N.Y., assignor to The Bendix Corporation, Southfield, Mich.
Filed Feb. 27, 1973, Ser. No. 336,311
Int. Cl. H01r *17/04*
U.S. Cl. 339—177 R **5 Claims**

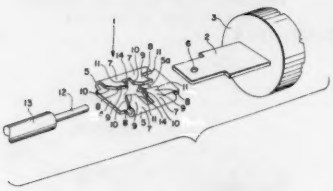


A contact assembly for the plug and jack portion of a coaxial cable connector assembly. The contact assembly includes a plurality of members which are demountably secured together by a metal retention clip.

3,825,884
ELECTRICAL CONNECTION CLIP
Bernard Charles Duchatellier, Paris, France, assignor to Rapid S. A., Paris, France
Filed Jan. 22, 1973, Ser. No. 323,597
Int. Cl. H01r *13/24*
U.S. Cl. 339—244 R **4 Claims**

An electrical coupling device designed for instantaneous manual coupling of a conductor, such as an electrical conductor wire, to the conducting pin of an electrical apparatus of any type. The coupling has the general cross-sectional shape

of a C whose body is approximately flat and has a lug protruding toward the inside of the C and whose wings are respectively constituted of a pair of small tongues which are sloped with respect to the base.



3,825,885

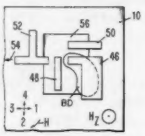
MAGNETIC BUBBLE DOMAIN SYSTEM HAVING IMPROVED OPERATING MARGINS

Robert J. Hendel, Glenham; Theodore F. Jamba, Jr., Vestal; George E. Keefe, Montrose, and Laurence L. Rosier, Amawalk, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 27, 1972, Ser. No. 266,758

Int. Cl. G11c 11/14

U.S. Cl. 340—174 TF **10 Claims**



A structure for increasing the reliability of a magnetic bubble domain memory system in which the operating margins of various components within the system are enlarged so that the margins of the components will have a larger area of overlap. For components in which a lessening of the effect of the bias field H_z is desirable (splitters, generators, corner propagation elements, etc.), a thin layer of magnetically soft material (for instance, permalloy) is provided which extends over the area of the magnetic sheet in which the component function takes place. This thin layer is in addition to the overlay elements used to provide the function. In a memory system, selectively placed "thin patches" of permalloy or strips of permalloy are used in the critical component areas to improve operating margins of these components.

3,825,886

TOWABLE SEISMIC DETECTOR CONVEYANCE

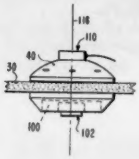
Ben B. Thigpen, Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

Filed May 3, 1971, Ser. No. 139,426

Int. Cl. G01s 9/66

U.S. Cl. 340—3 T **3 Claims**

Seismic exploration is conducted by towing a conveyance over the earth's surface. The conveyance includes a flexible support member, such as a thin, elongated flexible belt, carrying a plurality of seismic detectors which are suitably spaced apart. A signal channel interconnects the detectors with a signal utilization device. The belt extends sufficiently in a lateral direction to prevent the belt from rotating or twisting during tow about its longitudinal axis. Proper seismic coupling between the detectors and ground is achieved. If necessary the detectors can be acoustically isolated from the belt.



3,825,887

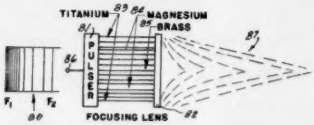
ULTRASONIC BAND TRANSMISSION, FOCUSING, MEASURING AND ENCODING SYSTEMS

Edward J. Murry, Palos Park, Ill., assignor to Fibra-Sonics, Inc., Chicago, Ill.

Filed Apr. 3, 1972, Ser. No. 240,577

Int. Cl. H04b 11/00

U.S. Cl. 340—15 **8 Claims**



A method and apparatus for transmitting sonic waves of all shapes and durations which utilizes a bundle of fibrous transmitting material which vary in length or material or density or distribution or locations such that the received wave may be selectively shaped and formed to meet a desired criteria.

3,825,888

DECODER CIRCUIT

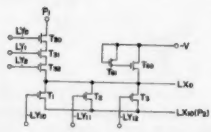
Hiroto Kawagoe, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed June 23, 1972, Ser. No. 265,475

Claims priority, application Japan, June 23, 1971, 46-44791

Int. Cl. H04l 3/00

U.S. Cl. 340—347 DD **4 Claims**



A decoder circuit with a matrix of MIS transistors wherein a first group of MIS transistors are provided between a potential supply source line and output leads, the transistors of the first group are connected in series, a second group of MIS transistors are provided between a ground line and the output leads, the transistors of the second group are connected in parallel, and gate electrodes of the first and second groups of transistos are connected directly to or indirectly through inverters to address input lines with a predetermined pattern in order to obtain desired output signals.

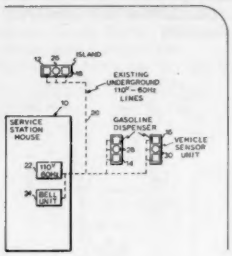
3,825,889
VEHICLE DETECTION SYSTEM

Ralph J. Koerner, Canoga Park, Calif., assignor to Canoga Controls Corporation, Canoga Park (L.A.), Calif.

Continuation-in-part of Ser. No. 125,724, March 18, 1971, Pat. No. 3,714,626. This application Jan. 8, 1973, Ser. No. 321,585

Int. Cl. G08g *1/01*

U.S. Cl. 340—38 L **5 Claims**



A system useful for indicating the entry of a vehicle onto a specified area of the earth's surface. The system includes a magnetic field sensor which yields an output signal indicative of the magnetic field intensity thereat. The sensor is mounted adjacent to but outside of a volume being monitored which constitutes the projection of the specified area in the direction of the magnetic field thereat. When the magnetically permeable mass of a vehicle enters the volume being monitored, it increases magnetic field intensity therein but reduces the field intensity outside of this volume. The reduction in field intensity is recognized by the sensor which then energizes an indicating device, which in the case of a service station installation, for example, can be a remote bell. The sensor preferably comprises a flux gate magnetometer mounted within a thin substantially rigid housing dimensioned to fit within a slot formed by saw cutting a roadway surface.

3,825,890
CONTROL SYSTEM FOR A TRAFFIC SIGNALLING APPARATUS

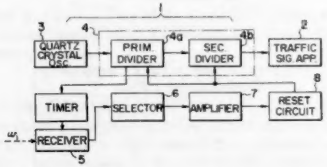
Takanori Miyazato; Keiichi Nakayama, both of Tokyo, and Masao Fujii, Koube, all of Japan, assignors to Kabushiki Kaisha Hattori Tokeiten, Tokyo, Japan

Filed July 17, 1970, Ser. No. 55,929

Claims priority, application Japan, July 17, 1969, 44-56325

Int. Cl. G08g *1/085*

U.S. Cl. 340—40 **10 Claims**



A traffic signalling apparatus having green, yellow and red signal lamps is controlled by a control system comprising a standard signal generator source having a constant high frequency output and a time cycle generator for generating time signals. A receiving circuit periodically receives a broadcast wave serving as a reference frequency source and appropriate frequencies are selected and used to compensate for frequency variations occuring in the time cycle generator. The control system may include a programming device whereby a programmed time cycle pattern of operation of the various colored signal lamps may be selectively changed at certain times of the day to most effectively control the traffic flow. The programming device may be used in conjunction with a series of traffic lights to variably stagger the operation of successive traffic lights in dependence upon changing traffic conditions.

3,825,891
BRAKE-LINING WEAR-INDICATOR

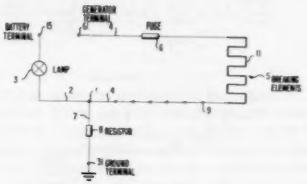
Norbert Kinast, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Jan. 12, 1972, Ser. No. 217,172

Claims priority, application Germany, Jan. 16, 1971, 2102077

Int. Cl. G08b *21/00*

U.S. Cl. 340—52 A **28 Claims**



A brake lining wear indicator installation for a brake with a rotatable brake member constructed, for example, as drum or disk, against which the brake lining retained in a brake shoe or the like is forced during the braking operation; an electric line carried in the brake is thereby ruptured or connected with ground as soon as the wear of the brake lining exceeds a predetermined value and a lamp is caused to be lighted up or another indicator representing an electrical resistance is thereby rendered operable.

3,825,892
ERROR DETECTOR FOR LOW DISPARITY CODE SIGNALS

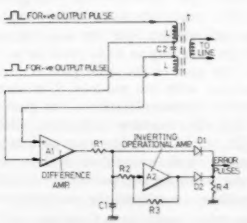
Richard John Catchpole, Bishop's Stortford, England, assignor to International Standard Electric Corporation, Armonk, N.Y.

Filed May 11, 1973, Ser. No. 359,387

Claims priority, application Great Britain, June 6, 1972, 26357/72

Int. Cl. G08c *25/00*

U.S. Cl. 340—146.1 AB **8 Claims**



This relates to error detection in a PCM system employing a low disparity code. A low disparity code is that type of code that over a long period of time the average number of MARKS and SPACES are approximately equal. When such a code is error free no direct current component is produced, but when an error occurs a low frequency component is introduced into

the average signal value. According to the present invention errors in a low disparity code signal are detected by employing a low pass filter that will respond to the low frequency component of the average signal value.

3,825,893

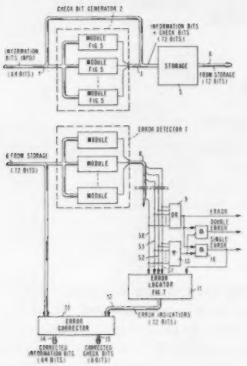
MODULAR DISTRIBUTED ERROR DETECTION AND CORRECTION APPARATUS AND METHOD

Douglas C. Bossen, Wappingers Falls; Se J. Hong; Mu-Yue Hsiao, both of Poughkeepsie, and Arvind M. Patel, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 29, 1973, Ser. No. 364,480

Int. Cl. H04l *1/10*

U.S. Cl. 340—146.1 AL **8 Claims**



Errors in code words fetched from memory or utilized in some other device are detected by apparatus distributed throughout the memory and then corrected. Illustratively, a 72-bit parallel code word, comprising a 64-bit information portion and an 8-bit check portion is fetched from the memory. The check bit generator consists of 8 identical modular units which, in the case of use in a memory, can be located at different locations within the memory. The identical modular units are connected in accordance with connections determined by an H matrix. The H matrix is partitioned into eight equal sections associated with eight information bits forming a byte and a single check bit. The rows of each partition or section are cyclically permutated from section to section. For example, the first row of the first section becomes the second row of the second section, etc. Each partition of the H matrix contains the same number of 1's and each row within a partition is part of a different code group. Each of the identical modular arrangements contains a logic circuit grouping. The input information byte bits are connected to the circuits of the logic grouping so as to produce as circuit outputs the parities of the part of the code groups in the partition or section associated with the module. The identical modular units also contain circuitry to receive the partial code groups parities from the other modular units concerned with the same code group. These partial code group parities and the partial code group parity of the respective module are combined to provide the check bit for the particular module. The partial code group parity outputs from the module are transmitted to the successive other modules to form the partial code group parity inputs for the respective modules. After the information has been utilized such as writing in storage, the information bits and check bits are read into an error detector which compares the check bits generated from the received information bits with the received check bits. An error locator analyzes any mismatch to determine the location of an error. An error corrector then corrects any information or check bit which is identified as incorrect by the error locator. The error detector can consist of the same identical modular units as the check bit generator.

3,825,894

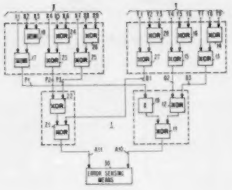
SELF-CHECKING PARITY CHECKER FOR TWO OR MORE INDEPENDENT PARITY CODED DATA PATHS

Allen M. Johnson, Jr., Endwell, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 24, 1973, Ser. No. 400,451

Int. Cl. H04l *1/10*; G06f *11/10*

U.S. Cl. 340—146.1 AG **8 Claims**



A series of self-checking error checking circuits are disclosed for checking two or more independent sets of parity coded data lines. Each data signal set includes any logical combination of binary "1's" and "0's" and at least one parity bit. Each checking circuit comprises two Exclusive-OR tree circuits wherein each tree obtains its inputs from different input lines of each set of independent data lines whereby complementing outputs are produced by the two tree circuits for any correct signal set when the checker is error free. Any error in the data will cause the two outputs to be the same. Malfunctions or failures in the checking circuit are checked by certain legitimate code signals which similarly cause an error representation in the output of the checker.

3,825,895

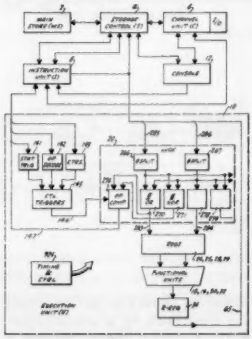
OPERAND COMPARATOR

Dee E. Larsen, San Jose, and Michael R. Clements, Santa Clara, both of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Filed May 14, 1973, Ser. No. 360,331

Int. Cl. G06f *7/04*

U.S. Cl. 340—146.2 **17 Claims**



Disclosed is a digital data processing system and comparator for comparing operands for equality relationships. The operands are compared on a bit-by-bit basis from the highest-

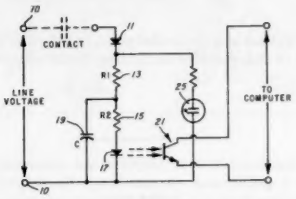
order bit toward the lowest-order bit. The comparison is carried out simultaneously and in parallel for all bits. The equality relationships determined by the comparison are greater than, less than, equal to, and overflow in the case of fixed point additions and subtractions. The comparisons are valid for positive and negative numbers in fixed point and normalized floating point arithmetic.

3,825,896

COMPUTER INPUT/OUTPUT INTERFACE SYSTEMS USING OPTICALLY COUPLED ISOLATORS

Robert E. Obenhaus, South Easton, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 1, 1972, Ser. No. 249,021
Int. Cl. H03k *17/56*
U.S. Cl. 340—147 R **10 Claims**



An input/output interface system for a digital computer utilizes an optically coupled isolator which provides electrical isolation between an external device and the computer. The signal from the external device may be of either A.C. or D.C. form, and the interface system output signal is a logic signal compatible with the I/O logic of the computer. The preferred optically coupled isolator comprises a light emitting diode which is selectively positioned with respect to a photo transistor, such that the diode and photo transistor are physically, and thus electrically, spaced apart but are optically coupled together. A current input signal passing through the light emitting diode causes the diode to radiate, the radiation being received at the base of the photo transistor, which then produces a logic signal indication. In an output interface circuit, the light emitting diode is connected to receive the digital output of the computer and the output of the photo transistor drives a gating circuit which gates power to a load. The interface circuits are particularly adaptable for use in computerized control systems wherein external devices are monitored or controlled.

3,825,897

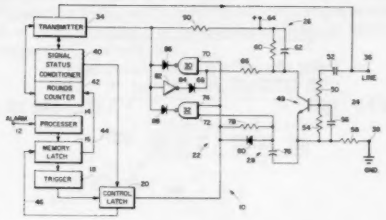
TRANSMITTER CONTROL CIRCUIT FOR ALARM SYSTEM

Richard A. Lawton, Don Mills, Ontario, Canada, assignor to Electronic Surveillance Corporation Limited, Willowdale, Ontario, Canada

Filed Sept. 24, 1973, Ser. No. 399,833
Int. Cl. H04g *3/00*
U.S. Cl. 340—147 LP **6 Claims**

In an alarm system having a plurality of stations connected to a single line, where each station has a transmitter which can transmit a pulsed signal to the line which is indicative of an alarm event at that station, it is important that "collisions" between signals from different stations on the same line be avoided. Line lock-out means are provided at each station to preclude transmission of a pulsed signal from that station when a pulsed signal from another station connected to the line is sensed; and the line lock-out means is provided with a timing circuit which operates to permit transmission from that station after a predetermined period of time following the last sensed pulse from another station on the line. Thus, the station may immediately transmit on the event of an alarm if sufficient time has passed since the last time a pulse from another station was sensed on the line; or the transmission is held off until that predetermined period of time follows the last sensed pulse on the line from another station.

However, in the event of continual sensing of a line busy condition because of an intermittent fault on the line or a "runaway" transmitter at another station, each station will seize the line after a predetermined length of time has passed since



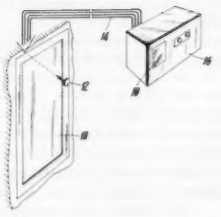
the event of an alarm at that station, regardless of the condition of the line. Thus, the line lock-out circuitry will preclude transmission of a signal from a station for about 5 seconds after sensing any pulse from another station, but the line may be seized after 5 seconds from the last sensing of a pulse from another station. A 2 minute "override" timer operates to seize the line regardless of its condition, two minutes after an alarm event at that station, if the alarm signal has not already been transmitted.

3,825,898

SAFETY LOCK WITH PROVISION FOR KEY USER IDENTIFICATION

Allan Miller, Irvington, N.Y., assignor to Phillips Screw Company, Natick, Mass.

Filed Feb. 17, 1971, Ser. No. 116,088
Int. Cl. H04g *3/00*
U.S. Cl. 340—149 R **14 Claims**

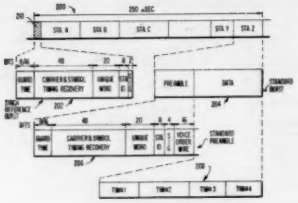


A lock includes a device capable of producing distinctly different electrical signals in response to the key employed to operate the lock. The keys capable of operating the lock are substantially identical in all details except for the depth of one signature notch. The output signal produced by the device is in turn proportional to the depth of the signature notch of the operating key. In the embodiment shown, the signal producing device includes a magnetic member movable within the lock by an extent corresponding to the depth of the signature notch, and a fixed transducing element capable of producing an output signal proportional to the relative position of the movable magnetic member. Also disclosed is a system employing the lock to prevent access of certain individuals into the protected premises only at certain times of the day.

3,825,899
EXPANSION/COMPRESSION AND ELASTIC BUFFER COMBINATION

Heinz H. Haeberle, Bethesda, Md., and John M. Husted, Vienna, Va., assignors to Communications Satellite Corporation, Washington, D.C.

Filed Aug. 11, 1971, Ser. No. 170,933
Int. Cl. H04j *3/00*
U.S. Cl. 340—172.5 **9 Claims**



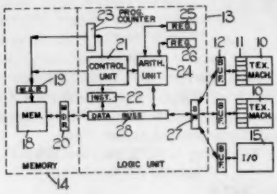
In a satellite transponder communications system operating in a time division multiple access mode, each earth station transmits data in a burst format. All bursts within a single transponder frame are synchronized to a special reference burst which contains no data communications. A single earth station sends out the reference burst as well as its normal burst, and in the case of a multitransponder and multi transponder frames, the single reference station sends out all of the reference bursts for the various transponder frames. Data to be transmitted may be received in many different forms and included within the same burst because of the modular arrangement of the earth stations. Individual terrestrial interface modules receive data in various forms, convert the data into bit form which is compatible with the TDMA system, store the converted bit stream and hold the compressed block of data until a multiplexer requests the block of data for inclusion into the earth stations transmitted burst. The arrangement of blocks of data within a burst and the timing and duration of a burst is controlled by digital words stored in a memory. Complete reordering of burst times and the arrangement of blocks of data within a burst is accomplished by changing the words stored in the memory. A comparable system on the receive side of the earth station extracts blocks of data in selected bursts for conveyance to selected terrestrial interface modules. A terrestrial interface module is provided for receiving data at a rate asynchronous with the TDMA bits rate and adding or subtracting dummy bit where necessary to provide the data out of the terrestrial interface module at a rate synchronized to the TDMA bit rate. The elastic buffer and compression/expansion buffer functions, necessary for handling asynchronous data and confining the data to assigned burst times, respectively, are combined in a single elastic-compression buffer on the transmit side and a single elastic-expansion buffer at the receive side.

3,825,900
TEXTILE MACHINES

John Ernest Anderson, Wednesfield, England, assignor to Midland Industrial Computing Limited, Birmingham, England

Filed June 28, 1972, Ser. No. 267,260
Claims priority, application Great Britain, June 29, 1971, 30322/71; Oct. 20, 1971, 48758/71
Int. Cl. D04b *15/66*
U.S. Cl. 340—172.5 **54 Claims**

The invention relates to the combination of a stored program digital computer and a textile producing machine having electromechanical actuators. The combination including one or more hardware buffers, each hardware buffer being associated with one or more of said actuators, the logic unit of the computer supplying information selectively to one or more

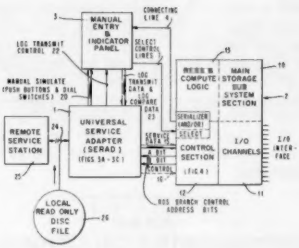


hardware buffers at a particular point or points in the cycle of operation of the machine according to the operation of the machine.

3,825,901
INTEGRATED DIAGNOSTIC TOOL

Bryan R. Golnek, Sr., Hyde Park, and Ronald M. Walton, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 9, 1972, Ser. No. 305,021
Int. Cl. G06f *11/00*
U.S. Cl. 340—172.5 **8 Claims**

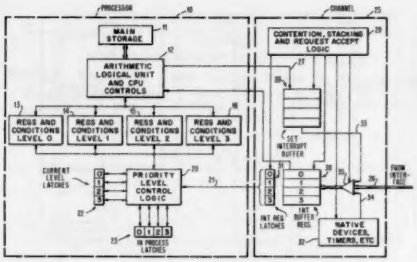


A universal adapter provides a standard interface to external equipment for testing and generally communicating with a data processing system. Linking main control elements of the system with diverse external test equipment, through a bit-serial binary communication terminal, the adapter provides a basis for establishing initial test conditions in the system while the latter is in a stopped or disabled condition. After initialization, the system is tested in its own dynamic environment at normal system speed. After the test, the system is again stopped or disabled. Responses to tests are sensed by the adapter through comparisons of selected status signals obtained from the system with predetermined reference signals furnished by the external test equipment. The adapter also cooperates with special monitoring circuits to selectively monitor and transmit to the external equipment signals representing internal system status. These signals are recorded and/or analyzed at the external equipment.

3,825,902
INTERLEVEL COMMUNICATION IN MULTILEVEL PRIORITY INTERRUPT SYSTEM

Wendell W. Brown; Michael I. Davis, and Ralph M. Pipitone, all of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1973, Ser. No. 356,014
Int. Cl. G06f 9/18
U.S. Cl. 340—172.5 **11 Claims**

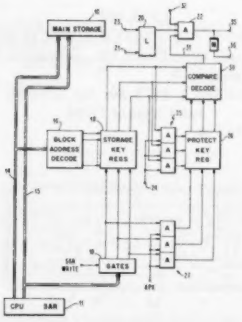


A data processor has multiple sets of hardware each of which is capable of autonomously controlling a common storage and common logical control circuits to execute a program. The hardware sets are allocated priority levels and are preferentially employed for handling interrupt service requests. Any hardware set which is interrupted in processing by a higher priority input request retains its processing status and resumes processing when control of the common elements is returned to it. Apparatus is included for addressing the set associated with a different priority level than the current level so that this different level can be preempted for another task. The presence of an interrupted program in the preempted level can be detected and its critical status stored for restoration after completion of the preempting program.

3,825,903
AUTOMATIC SWITCHING OF STORAGE PROTECT KEYS

Wendell W. Brown, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1973, Ser. No. 356,015
Int. Cl. G06f 9/18
U.S. Cl. 340—172.5 **8 Claims**

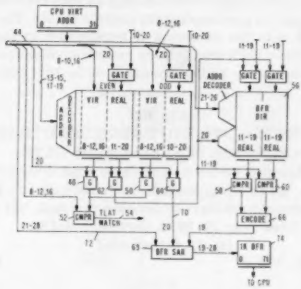


Storage protect keys are placed in a register in correlation to blocks of main storage. Initialization of a problem program is accompanied by selection of one of these registers via the high order bits of the first instruction to be executed. The key is stored in a separate store and thereafter compared against the key retrieved from the register addressed by the high order bits of each subsequent instruction. Failure to compare indicates a storage boundary has been crossed and an unauthorized instruction execution is being attempted.

3,825,904
VIRTUAL MEMORY SYSTEM

John L. Burk, Poughkeepsie; Daniel M. Duffy, Hyde Park; Spurgeon G. Hogan, Jr., Poughkeepsie; Russell H. Larson, Wappingers Falls, and Bruce L. McGilvray, Pleasant Valley, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 8, 1973, Ser. No. 368,544
Int. Cl. G06f 3/00
U.S. Cl. 340—172.5 **5 Claims**



This specification describes a virtual memory system in which a set of conversion tables is used to translate an arbitrarily assigned programming designation called a virtual address into an actual main memory location called a real address. To avoid the necessity of translating the same addresses over and over again, a table called the Directory Look Aside Table (DLAT) retains current virtual to real address translations for use where particular virtual addresses are requested more than once. The DLAT not only stores translations of requested address but also stores translations of addresses that immediately precede or succeed the requested address in the virtual address sequence in anticipation of their being requested. Furthermore, to simplify the translation process data obtained from the translation table during the last translation is stored in anticipation of its use in the next request for translation.

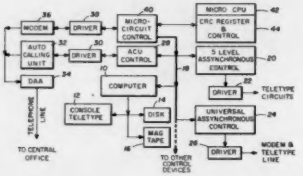
3,825,905
BINARY SYNCHRONOUS COMMUNICATIONS PROCESSOR SYSTEM AND METHOD

Chester C. Allen, Jr., Richardson, Tex., assignor to Action Communication Systems, Inc., Dallas, Tex.

Filed Sept. 13, 1972, Ser. No. 288,734
Int. Cl. G06f 3/00, 11/08
U.S. Cl. 340—172.5 **11 Claims**

The specification discloses a communications processor system including a message switching digital computer programmed to receive binary coded data from a plurality of communication control devices connected to communication lines. The binary coded data is stored in the computer and subsequently transmitted to designated ones of the communication control devices. At least one of the communication control devices comprises a binary synchronous system which includes circuitry for converting serial digital data received from a communication line into parallel digital data. The parallel digital data comprises line control characters, text data and cyclic redundancy checking (CRC) characters. A micro central processor unit receives the digital data and, in

response to the line control characters, synchronizes and forms the text data into message blocks. After completion of a message block, a CRC error code signal is computed and compared with the CRC characters contained within the digital data. If the error check is satisfactory, the message block is



transmitted to the computer for storage and for later transmittal to a designated communication control device. The digital data utilized with the invention is transmitted in the transparent text mode such that the line control characters may be selectively utilized for control functions or for text data.

3,825,906

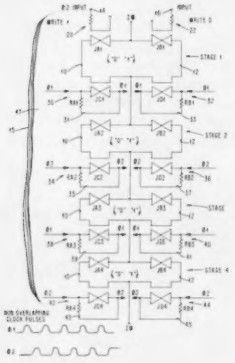
SUPERCONDUCTIVE SHIFT REGISTER UTILIZING JOSEPHSON TUNNELLING DEVICES

Harvey C. Hamel; Charles A. Kunzinger, and William K. Stelzenmuller, all of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 29, 1973, Ser. No. 375,236

Int. Cl. G11c *11/44*

U.S. Cl. 340—173.1 **7 Claims**



A two-phase superconductive shift register using Josephson tunnelling devices is provided wherein a plurality of shift register stages each includes a first and second branch in parallel to which a DC current is supplied. A Josephson tunnelling device is located in each branch which operates in its no voltage state when the DC current is applied thereto. A first and second input means is provided for switching one of the Josephson tunnelling devices in accordance with an input to cause the input current to flow through the other branch. A first and second coupling means are located between the stages of the shift register, the first coupling means coupling the first branch circuits of successive stages and the second coupling means coupling second branch circuits of successive stages. The coupling means are energized in response to phase time pulses and current flow in the preceding stage causing the Josephson device in the next stage to switch to its finite voltage stage thereby causing the current to flow in the opposite branch in the next stage.

3,825,907

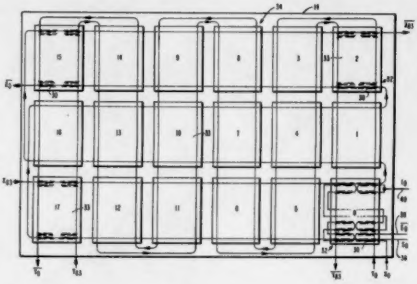
PLANAR CORE MEMORY STACK

Victor L. Sell, Santa Monica, and Syed M. S. Alvi, Placentia, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Continuation-in-part of Ser. No. 165,477, July 26, 1971, Pat. No. 3,711,839. This application Oct. 5, 1971, Ser. No. 186,621

Int. Cl. G11c *5/08, 11/06*

U.S. Cl. 340—174 MA **32 Claims**



A planar, pluggable core memory stack is provided having a variable word and bit length. The highly versatile stack includes a single printed circuit board having symmetrical plug connectors and printed circuits permitting either a first size memory to be mounted on one side with pluggable attachment in a first orientation or a different size memory to be mounted on the other side with pluggable connection in an opposite orientation. The number of bits in each word may be varied between one and 18 regardless of which side the cores are mounted on. The cores are grouped into closely spaced mats, one for each bit, and all of the mats lie in the same plane. The close core spacing, a four corner wiring technique, and a disclosed method of mounting components permits all of the core mats as well as diode decoder arrays to be mounted entirely on a selected side of the printed circuit board without interfering with circuits printed on the other side to accommodate a different size of memory. Disclosed alternative wiring arrangements include a common X and Y drive technique which reduces the number of driver switches by about 1/2 and a 3 1/2D configuration which permits a trade off between word and bit size or the number of address lines within a single board or the use of two planar stacks together with no increase in the number of address lines.

3,825,908

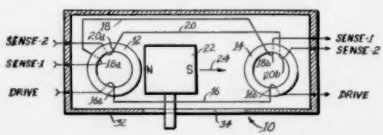
SOLID STATE SWITCH STRUCTURE

Keith A. Engstrom, River Grove, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Feb. 2, 1973, Ser. No. 328,908

Int. Cl. G11c *11/06*

U.S. Cl. 340—174 PM **4 Claims**



The embodiment of the invention disclosed herein is directed to a solid state switch structure which includes first and second spaced apart saturable magnetic cores. The cores are saturated in the presence of a magnetic field of given

strength. A drive wire passes through both cores, and a pair of sense wires pass through both cores but are wound thereabout in opposite directions. The saturation of one of the magnetic cores causes an output signal from one sense wire of one polarity and an output from the other sense wire of the opposite polarity. Moving the magnet from adjacent one saturable magnetic core to adjacent the other saturable core reverses the polarity of the output signals at the sense wires. While moving the magnet between saturable magnetic cores a point is reached whereupon no output signal is sensed at either sense wire.

3,825,909

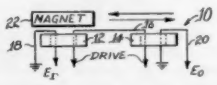
SOLID STATE SWITCH STRUCTURE

Keith A. Engstrom, River Grove; Victor M. Bernin, Mount Prospect, and George J. Bury, Lake Villa, all of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Feb. 2, 1973, Ser. No. 328,909

Int. Cl. G11c *23/00*

U.S. Cl. 340—174 PM **3 Claims**



The embodiment of the invention disclosed herein is directed to a solid state switch structure which includes first and second spaced apart closed magnetic core structures. The cores are saturated in the presence of a magnetic field of given field strength. Drive wire means pass through the cores and a pair of sense wires pass through both cores to receive pulse signal information from the drive wire when one or both of the cores is in an unsaturated condition. The saturation of one core provides an output signal from one sense wire and no output signal from the other sense wire while saturation of the other core reverses the output signals from the different sense wire. Movement of the magnetic member from registry with one core to registry with another core will provide mechanically hysteresis. This is accomplished by positioning the magnet and cores in such a manner that a finite movement of the magnet is at all times required between the on and off conditions of the switch.

3,825,910

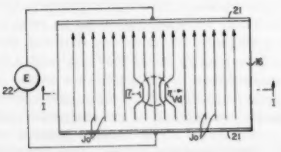
PROPAGATION OF MAGNETIC DOMAINS BY SELF-INDUCED DRIVE FIELDS

Walter J. Carr, Jr., and Robert C. Miller, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 250,706, May 5, 1972. This application June 11, 1973, Ser. No. 368,914

Int. Cl. G11c *11/14*; **G01r** *11/06*

U.S. Cl. 340—174 TF **21 Claims**



A magnetic domain propagation device has a self-induced drive field for moving a magnetic domain in a thin magnetic layer of ferro-magnetic material. A domain drive layer formed of a current conducting material overlays the magnetic layer in a magnetically coupled relationship. An electric field is applied to the drive layer to produce a uniformly distributed current therein adjacent to the surface of the magnetic layer. A magnetic domain in the magnetic layer alters the uniform current density of the drive layer to produce a perturbed current region adjacent the magnetic domain. A resultant magnetic field is produced by the perturbed current which interacts with the magnetization of the magnetic domain so as to provide an induced drive magnetic field. The velocity and direction of the magnetic domain is controllable by variation of the applied electric field or by varying the current perturbing effects in the drive layer.

3,825,911

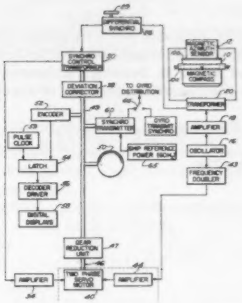
REMOTE READING COMPASS SYSTEM

Harold S. Burns, Falmouth, Mass., assignor to Electro Marine Corp.

Continuation-in-part of Ser. No. 88,427, Nov. 10, 1970, abandoned. This application Dec. 7, 1972, Ser. No. 312,951

Int. Cl. G08c *5/00*

U.S. Cl. 340—198 **6 Claims**



A magnetic compass system having an inductor element which is responsive to the magnetic field generated by a magnet system attached to a compass card, or directly from the earth's natural magnetic field, the inductor element having alternating current supplied thereto and having polyphase output connected to a servo loop having usual mechanical shafting, which is connected to a dial read-out. Within the servo loop a synchro differential may be placed to correct the indicated reading of the compass for magnetic variation and an encoder may be connected to the mechanical shaft of the servo loop to convert the rotary motion into logic signals such as binary coded signals, which then can be followed by a storage latching circuit and a decoder driver so that the output can be read on standard digital display units. Also by adding a 400 Hz or a 60 Hz synchro transmitter to the servo loop output shaft, the information available from the magnetic compass system, which is suitably corrected for variation, is available to the gyro distribution system and may therefore supply heading information to radar and other gyro repeater devices in the event of main gyro failure.

3,825,912

TORQUE WRENCH MONITOR

Dennis M. Wiese, Warren, and Raymond P. Sawicki, Wyandotte, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

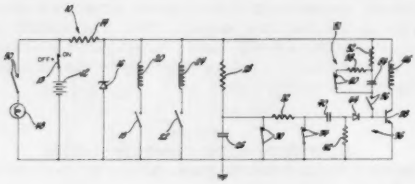
Filed July 12, 1973, Ser. No. 378,664

Int. Cl. G08b *23/00*

U.S. Cl. 340—213 R **2 Claims**

A circuit for providing an indication each time a threaded element has been properly tightened by a power torque wrench. A first switch is actuated upon the initiation of operation of the torque wrench to enable a capacitor to be charged at a predetermined rate. A second switch is responsive to the achievement of a predetermined torque output by the torque

wrench to couple the charge across the first capacitor to the base of a transistor through a second capacitor. If the elapsed time between the actuation of the first switch and the actuation of the second switch is greater than a predetermined



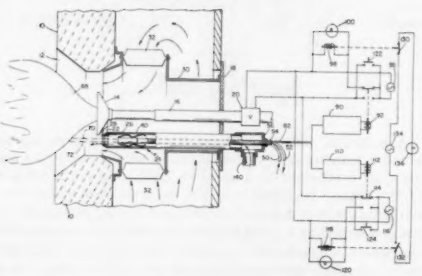
minimum, the signal coupled to the base electrode of the transistor is sufficient to bias the transistor into conduction to energize a lamp for providing an indication that the bolt has been properly tightened.

3,825,913

FUEL BURNER SUPERVISORY SYSTEM

Arthur G. B. Metcalf, Winchester; Philip Guiffrida, North Andover, and Alfred H. Bellows, Cambridge, all of Mass., assignors to Electronics Corporation of America, Cambridge, Mass.

Filed Mar. 31, 1972, Ser. No. 240,074
Int. Cl. F23n *5/08*; **G08b** *17/12*
U.S. Cl. 340—228 **15 Claims**



Fuel burner supervisory system wherein a pair of flame sensors are located close to the flame being supervised, periods of flame absence are simulated for each sensor, elements are respectively responsive to the sensors to assume a trouble state when an associated sensor indicates the absence of flame other than during a period of simulated flame absence, or when the sensor indicates the presence of flame during a period of simulated flame absence, and a flame failure alarm is connected to signal when both elements are in their trouble states, thus indicating a likely absence of flame.

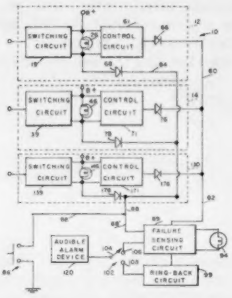
3,825,914

LAMP FAILURE DETECTOR ASSEMBLY

Robert Schacket, Laurelton, N.Y., assignor to Electrospace Corporation, North Bergen, N.J.

Filed Dec. 22, 1972, Ser. No. 317,762
Int. Cl. G08b *21/00*
U.S. Cl. 340—251 **5 Claims**

A lamp failure detector assembly includes a plurality of lamp filament sensors. Each lamp filament sensor includes a switching circuit which is connected to an associated pilot lamp to be monitored and to a transducer which is capable of assuming one of two states. In one state of the transducer, the switching circuit causes a current having one level to flow through the lamp, the level being sufficient to visibly light the lamp. In the other state of the transducer, the switching circuit causes a current to flow through the lamp which is insufficient to visibly light the lamp. A control circuit is connected to the pilot lamp to be monitored — the control circuit being so arranged so as to cause a monitoring current to flow through the pilot lamp when the filament of the latter is good irrespective of the state of the transducer, the monitoring current which passes through the bulb and through the control circuit having a level sufficient to be detected by the control circuit yet insufficient to visibly light the lamp. Each control circuit of a respective lamp filament sensor is arranged to sense the level of current flow through an associated pilot lamp and for generating a control signal when current flow through the pilot lamp is interrupted. A failure sensing circuit is connected to each of the control circuits for receiving a control signal



when one of the monitored pilot lamps fails and for energizing a failure indicator lamp as well as an audible alarm device. A ring-back circuit connected to the failure sensing circuit is connectable to the audible alarm device so that when the audible alarm device is connected to the ring-back circuit while one of the monitored pilot lamps is faulty, the audible alarm device is not energized. When the faulty pilot lamp is replaced by a good lamp, the failure sensing circuit and the ring-back circuit change their respective states so that the failure indicator lamp is deenergized and the audible alarm device is energized. The latter energization of the audible alarm device is termed the ring-back and gives an indication that a faulty bulb has been replaced by a good one — the ringing back being continued until the audible alarm device is again connected to the failure sensing circuit.

3,825,915

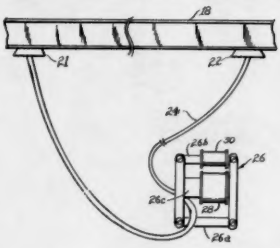
CIRCUIT FOR SENSING THE ABSENCE OF A SAFETY GROUND IN AN ELECTRICALLY OPERATED TRANSPORT VEHICLE SYSTEM

Ronald C. Dow, Richardson, Tex., assignor to Monocab, Inc., Garland, Tex.

Filed Sept. 20, 1972, Ser. No. 290,449
Int. Cl. G01r *31/02*; **B61l** *3/00*; **G08b** *21/00*
U.S. Cl. 340—256 **4 Claims**

The embodiment of the invention disclosed herein is directed to a circuit for sensing the absence of a safety ground from electrically operated machines or vehicles. The circuit includes a magnetic frame having first and second magnetic circuit paths extending about the frame with a common circuit portion thereof from which excitation energy is induced into the magnetic frame. A single turn closed loop winding is positioned about one portion of the magnetic frame and a load winding is positioned about another portion of the magnetic frame. During normal conditions, when the closed loop winding is maintained, this indicating good connection for the safety ground, the magnetic flux path is primarily directed about the magnetic frame to maintain maximum excitation of the load winding. This load winding is then connected to a transistor circuit which operates an indicating device of any suitable kind. Upon disconnection of the safety ground, the closed loop winding becomes open circuited and the im-

pedance of the magnetic field in the magnetic frame changes abruptly to cause a substantial reduction in the magnetic cir-



cuitry associated with the load winding. This then causes automatic energization of the indicator for indicating that safety ground has been lost.

3,825,916

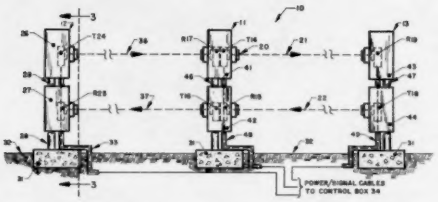
LASER FENCE

Richard K. Steele, Sacramento, and Douglas E. Roudabush, Carmichael, both of Calif., assignors to California Crime Technological Research Foundation, Sacramento, Calif.

Filed Oct. 20, 1972, Ser. No. 299,456

Int. Cl. G08b *13/18*

U.S. Cl. 340—258 B **1 Claim**



First and second transmitting stations provide two, parallel, line-of-sight, pulsed beams of infrared energy generated from a solid state source. The (laser) beams are intercepted by corresponding receiving stations. The two line of sight beams are displaced horizontally and vertically from each other; and by orienting the beams along a perimeter to be protected, any invasion of the perimeter is sensed by interruption of the beams. Detection of animals, such as dogs, is negated by logic circuitry affording height discrimination. The circuitry also discriminates with respect to man parameters, such as man's usual forward velocity, namely, approximately ½ feet per second to 10 feet per second. False alarms from flying birds, leaves and the like, are thereby minimized. Intrusions can be indicated by audible and visual local alarms, or, if desired, by automatic telephone dialing, radio or closed circuit TV to more distant centers. By using additional stations and corner reflectors, where appropriate, a continuous chain is constructed to enclose an area to be guarded.

3,825,917

SECURITY WINDOW

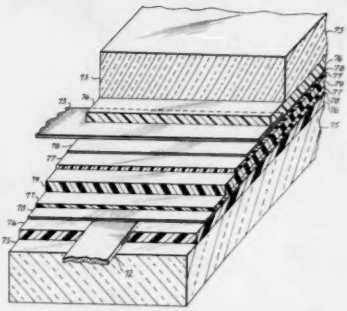
Clyde L. Lucky, Santa Susana, Calif., assignor to The Sierracin Corporation, Sylmar, Calif.

Filed Nov. 16, 1972, Ser. No. 307,089

Int. Cl. G08b *13/04*

U.S. Cl. 340—274 **10 Claims**

A security window system having a transparent structure having high resistance to penetration is described. A transparent conductive layer is provided over most of the area of the window and the resistance of the layer is monitored for sensing penetration. Preferably the layer is subdivided into a number of conductive regions for substantially increasing the sensitivity of the system to minor interruptions in the layer. Temperature and stress effects can be minimized by connecting different conductive areas of the layer as arms of a resistance bridge. An alarm may be sounded when a small steady state change in resistance is sensed or when a rapid change in resistance is sensed.



3,825,918

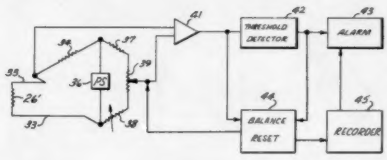
IMPACT SENSITIVE SECURITY WINDOW SYSTEM

H. Gordon Laidlaw, Jr., Thousand Oaks, and Berton P. Levin, Santa Monica, both of Calif., assignors to The Sierracin Corporation, Sylmar, Calif.

Filed Nov. 16, 1972, Ser. No. 307,090

Int. Cl. G08b *13/04*

U.S. Cl. 340—274 **11 Claims**



A security window system having a transparent structure having high resistance to penetration is described. A transparent conductive layer is provided over most of the area of the window and the resistance of the layer is monitored for sensing penetration. Preferably the layer is subdivided into a number of conductive regions for substantially increasing the sensitivity of the system to minor interruptions in the layer. Temperature and stress effects can be minimized by connecting different conductive areas of the layers as arms of a resistance bridge. An alarm may be sounded when a small steady state change in resistance is sensed or when a rapid change in resistance is sensed.

3,825,919

LAMINATED SECURITY WINDOW

Berton P. Levin, Santa Monica, and Roger E. Nelson, Northridge, both of Calif., assignors to The Sierracin Corporation, Sylmar, Calif.

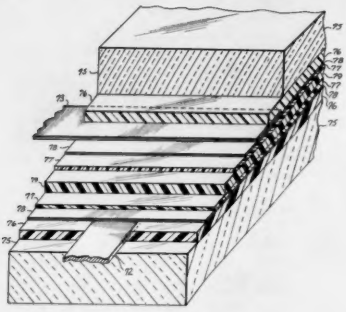
Filed Nov. 16, 1972, Ser. No. 307,095

Int. Cl. G08b *13/04*

U.S. Cl. 340—274 **20 Claims**

A security window system having a transparent structure having high resistance to penetration is described. A transparent conductive layer is provided over most of the area of the window and the resistance of the layer is monitored for sensing penetration. Preferably the layer is subdivided into a number of conductive regions for substantially increasing the

sensitivity of the system to minor interruptions in the layer. Temperature and stress effects can be minimized by connecting different conductive areas of the layer as arms of a resistance bridge. An alarm may be sounded when a small steady state change in resistance is sensed or when a rapid change in resistance is sensed.

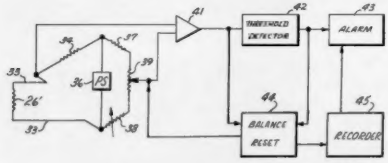


3,825,920

LAMINATED SECURITY WINDOW SYSTEM

Roger E. Nelson, Northridge, and Clyde L. Lucky, Santa Susana, both of Calif., assignors to The Sierracin Corporation, Sylmar, Calif.

Filed Nov. 16, 1972, Ser. No. 307,096
Int. Cl. G08b *13/04*
U.S. Cl. 340—274 **16 Claims**



A security window system having a transparent structure having high resistance to penetration is described. A transparent conductive layer is provided over most of the area of the window and the resistance of the layer is monitored for sensing penetration. Preferably the layer is subdivided into a number of conductive regions for substantially increasing the sensitivity of the system to minor interruptions in the layer. Temperature and stress effects can be minimized by connecting different conductive areas of the layer as arms of a resistance bridge. An alarm may be sounded when a small steady state change in resistance is sensed or when a rapid change in resistance is sensed.

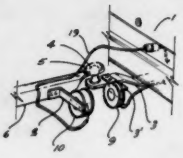
3,825,921

TRAILER POSITION INDICATOR

Louis J. Marus, 9151 River Bluff Rd., Millington, and James D. Abernathy, Memphis, both of Tenn., assignors to said Marus and Bogatin, by said Abernathy, a part interest to each

Filed Nov. 17, 1972, Ser. No. 307,475
Int. Cl. G08b *21/00*
U.S. Cl. 340—282 **6 Claims**

A system for indicating to an operator of a towing vehicle the relative disposition of a towed trailer, comprising an emitter provided on said towing vehicle, a coil mounted upon the trailer for induction of a current therein, the strength of which current will depend upon the relative positioning of said emitter and said coil, an instrument provided in said towing



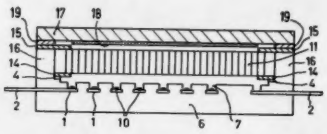
vehicle for indicating the strength of the induced current and being connected to said coil, and a source of alternating current connected to said emitter.

3,825,922

CHANNEL PLATE DISPLAY DEVICE HAVING POSITIVE OPTICAL FEEDBACK

John Ernest Ralph, Salfords, near Redhill, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 22, 1973, Ser. No. 325,852
Claims priority, application Great Britain, Feb. 8, 1972, 5789/72
Int. Cl. H01j *39/18*
U.S. Cl. 340—324 M **4 Claims**



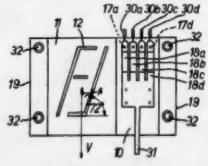
Display device comprising a cathode-luminescent layer, a plurality of electron multiplier elements, and a plurality of individually energisable cathodes. The cathodes are photocathodes and an optical feedback path is provided between said luminescent layer and said photo-cathodes through said electron multiplier elements.

3,825,923

VISUAL DISPLAY APPARATUS WITH CHARACTER MATRIX

Gerhard Pirchl, Dietikon, Switzerland, assignor to Romay AG, Oberkuln, Switzerland

Filed Sept. 8, 1972, Ser. No. 287,267
Claims priority, application Switzerland, Sept. 15, 1971, 13490/71
Int. Cl. G09f *9/32*
U.S. Cl. 340—336 **6 Claims**



An apparatus for the visual indication or display of characters, especially decimal numerical characters, which characters are associated with successive adjustments or settings of an adjustment component and a base body and of which

characters there is visually indicated during each adjustment or setting the character associated therewith. The base body comprises a visual surface composed of a character matrix consisting of lines for the characters to be displayed or indicated. There are also provided cover elements adjustable by the adjustment component for the lines of the character matrix in order to cover during successive adjustments the excessive lines of the character matrix which are not needed for the visual display of the relevant character.

3,825,924

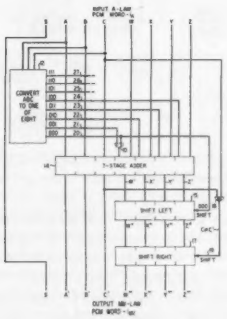
PULSE CODE MODULATION CODE CONVERSION

William Lloyd Montgomery, Little Silver, N.J., assignor to Bell Telephone Labortories, Incorporated, Murray Hill, N.J.

Filed June 27, 1972, Ser. No. 266,690The portion of the term of this patent subsequent to Aug. 29, 1989, has been disclaimed.

Int. Cl. G06f *7/38*

U.S. Cl. 340—347 DD **11 Claims**



Method and apparatus for the direct digital conversion between PCM codes representing two different companding laws. The mu-law and the A-law code words each contain the eight bits S ABC WXYZ, where S is the sign of the signal sample, ABC is the segment code, and WXYZ is the position code. Together the segment and position codes describe the amplitude of the signal sample, which is generally different in the two systems. Code conversion is accomplished by identifying the value of the segment code and selectively incrementing, decrementing and shifting the position code. Mid-riser as well as mid-tread forms of the A-law are considered.

3,825,925

CONVERTER OF DIGITAL DATA INTO ANALOGUE DATA

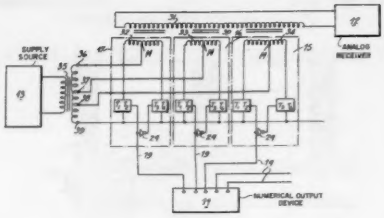
Gaston Joseph Drusch, 38 Avenue Douglas Haig, Versailles, France

Filed Apr. 10, 1973, Ser. No. 349,864

Claims priority, application France, Apr. 10, 1972, 72.12518

Int. Cl. H04l *3/00*; **H03k** *13/00*

U.S. Cl. 340—347 DA **11 Claims**



The present device includes a number of networks each having an analogue output corresponding to the weight of a digital signal applied to an input terminal thereof. The inputs are connected to respective outputs of a digital source, and the outputs of the networks are connected in series for applying an analogue version of the complete digital input signal to a receiving device.

3,825,926

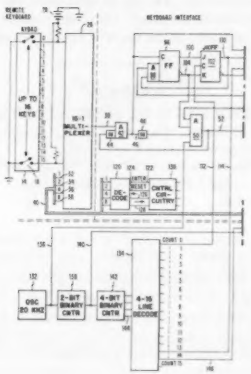
INTERFACING CIRCUITRY FOR CONNECTING A REMOTE KEYBOARD WITH A DATA RECEIVING BUFFER

Dewey Earl Brownback, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 5, 1973, Ser. No. 329,955

Int. Cl. H04l *15/06*

U.S. Cl. 340—365 E **3 Claims**

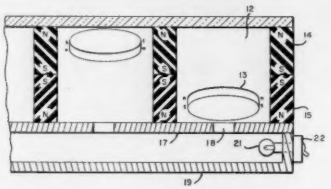


Interfacing circuitry connected with a multiplexer activated by keyboard switches and providing an output on the application of a code thereto corresponding with a particular keyboard switch when actuated, the interfacing circuitry including a keyboard counter inhibited in its counting action by an output signal from the multiplexer on depression of one of the keyboard keys and supplying a code to the multiplexer, gating means for gating the content of the counter to a buffer, and delay means for delaying the gating action to the buffer until the expiration of a predetermined time after the raising of an output of the multiplexer. The delay means includes an oscillator driving a decode or counter providing timed successive output signals, and a plurality of flipflops under the control of these timing signals.

3,825,927
MAGNETIC DISCBOARD

Renold R. Passien, 375 Flamingo Ave., Campbell, Calif. 95008

Filed June 14, 1972, Ser. No. 138,728
Int. Cl. G08b *5/24*
U.S. Cl. 340—373 **3 Claims**

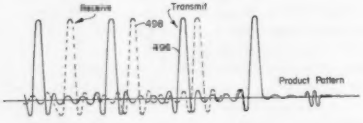


A magnetic display device of the type wherein magnetized discs are selectively moveable within closely spaced openings or chambers in a laminated panel, the panel including a pair of magnetized sheets with their magnetic poles similarly disposed, openings extending through both sheets, and a bipolar magnetized disc positioned within each opening for rotation and shuttle movement under the influence of a selectively applied magnetic field, and non-magnetic cover sheets secured to opposite surfaces of the magnetic sheets. A light panel is mounted on the rear surface of the laminated panel. Shuttling of the discs with a magnetic stylus from the rear, a position of rest (erase state) to the front (write state) exposes a ray of light in each chamber. The display of individual characters is achieved by the forward and rear movement of the individual discs in each chamber. When the discs are in the rear (erase state), they block the rays of light coming through the rear panel. This is easily accomplished since the diameter of the chambers in the rear is smaller than the diameter of the front chambers. However, when the discs are in the (write state) forward position, the ray of light from each chamber is free to travel to the front panel. This then presets (in the dark) a pattern of characters in the form of small dots of light.

3,825,928
HIGH RESOLUTION BISTATIC RADAR SYSTEM

Frederick C. Williams, Topanga, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Feb. 14, 1972, Ser. No. 225,807
Int. Cl. G01s *9/02*; **H01q** *3/26*
U.S. Cl. 343—5 R **6 Claims**

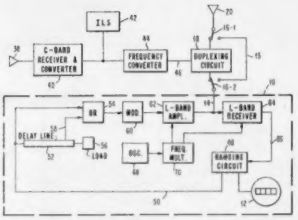


A bistatic radar system using separate antennas for transmit and receive and taking advantage of the fact that the net radar resolution depends on the product of the two gain patterns. In one illustrated system of the invention, a low resolution transmitter pattern is combined with an ambiguous high resolution receiver pattern formed of a thinned array of phase controlled radiating elements. The elements are separated by a distance greater than the wavelength of the RF signal. In this thinned array approach, the suppressed receive grating lobes may be placed at alternate nulls of the transmit pattern by spacing the receiver array elements to be approximately one-half the transmitted antenna width. The transmit radar forms a conventional sector scanning antenna pattern that illuminates the forward area and the receiving antenna has elements spaced so they form a multilobe pattern that contains selected spacing of grating lobes. In operation only one of these grating lobes is illuminated by the transmit pattern. The transmit and receive antennas are scanned in synchronism either sequentially or in some jump scan sequence to provide the sector scan display. The system is operable substantially without microwave waveguides in the wings of an aircraft by providing a local oscillator signal that is phase shifted to control the antenna pointing. Other systems in accordance with the invention may also utilize a thinned array for transmitting and a single lobe antenna receiving or may utilize thinned array for both transmitting and receiving.

3,825,929
COMPATIBLE SPLIT-BAND DISTANCE MEASURING METHOD AND APPARATUS

Donald J. Toman, Pleasantville, N.Y., assignor to Tull Aviation Corporation, Armonk, N.Y.

Filed Dec. 26, 1972, Ser. No. 318,230
Int. Cl. G01s *9/06*, *9/56*
U.S. Cl. 343—6.5 R **21 Claims**

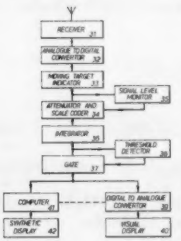


L-band signals transmitted from an airborne distance measuring equipment elecit a response from a ground station in C-band. The C-band response is converted in the airborne equipment to L-band to derive a distance measurement. The utilization of unwanted response signals received by direct radiation in L-band is prevented when C-band responses are expected.

3,825,930
RADAR PROVIDED WITH PULSE REPETITION FREQUENCY DISCRIMINATION

Eric Davies, Essex, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed Dec. 21, 1972, Ser. No. 317,161
Claims priority, application Great Britain, Dec. 23, 1971, 60141/71
Int. Cl. G01s *9/42*
U.S. Cl. 343—7.7 **18 Claims**



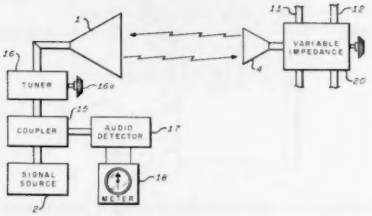
In order to reduce the effect of jamming pulses or spurious noise on the operation of a radar, incoming signals are attenuated to below a threshold level. Only those pulses which on integration over a number of pulse repetition periods exceed the

threshold level are utilised. Additional information concerning a radar target is obtained from the degree of alternation to which each incoming signal is subjected in order to bring it below the threshold level.

3,825,931
PHASE FRONT DETECTION SYSTEM

Robert E. Gonzalez, Tampa, and Harry F. Strenglein, Clearwater, both of Fla., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Aug. 1, 1972, Ser. No. 277,005
Int. Cl. G01r *29/10*
U.S. Cl. 343—100 AP **2 Claims**

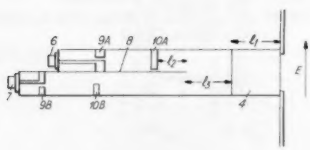


The invention is an improved arrangement for the detection of the location of the phase front of a signal emitted by a large aperture antenna by employment of a reflecting test device comprising a cyclically varied impedance.

3,825,932
WAVEGUIDE ANTENNA

George Alfred Hockham, Takeley, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed May 16, 1973, Ser. No. 360,724
Claims priority, application Great Britain, June 8, 1972, 26760/72
Int. Cl. H01q *13/06, 1/48, 5/00*
U.S. Cl. 343—776 **3 Claims**

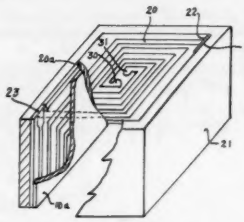


This invention relates to a multi-frequency phased array steerable beam waveguide antenna in which the waveguide radiator elements have a cut-off frequency between two operating frequencies of the antenna. At the lower frequency the waveguides are terminated to function as evanescent mode resonators giving a first passband centered on the lower frequency. At the higher frequency the waveguides are propagating and are terminated to give a second passband centered on the higher frequency.

3,825,933
SPIRAL ANTENNA STRIPLINE TERMINATION

Thomas R. Debski, Bethpage, and Joseph G. Gaudio, Port Jefferson Station, both of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed July 18, 1973, Ser. No. 380,420
Int. Cl. H01q *1/36*
U.S. Cl. 343—895 **2 Claims**

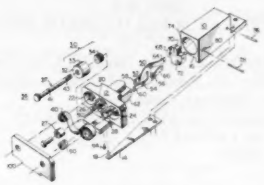


A high power stripline termination for a spiral antenna is provided wherein the termination is mounted within the cavity of the antenna. The termination is comprised of a spiraling length of transmission line etched on a lossy substrate. The spiraling line permits the use of an effectively long transmission line within a small area.

3,825,934
SCRATCH STRAIN RECORDER

Ronald Price, Hazeldean, Ontario, and Jozsef W. Kelemen, Ottawa, Ontario, both of Canada, assignors to Leigh Instruments Limited, Carleton Place, Ontario, Canada

Filed May 2, 1973, Ser. No. 356,634
Int. Cl. G01c *7/04*; G01d *9/38*
U.S. Cl. 346—7 **12 Claims**

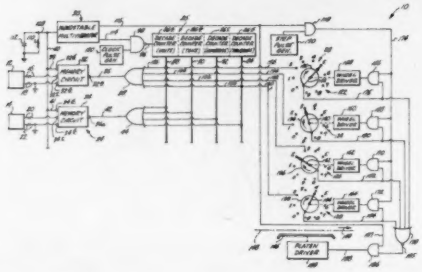


A scratch strain recorder is disclosed which is comprised of a support assembly and a recording head assembly. The recording head assembly includes a recording tape storage means and a recording tape transport means. A recording element is provided comprising an arm and a recorder stylus. One end of the arm is fixed to the support assembly with the other end of the arm carrying the recorder stylus and urging the stylus against a recording tape at a recording station within the recording head assembly. The device further comprises a rotational drive source means connected between the support assembly and the recording head assembly. The recording tape transport means comprises a unidirectional drive connected at one end to the rotational drive source means an operatively associated at its other end with the tape for transporting said tape in one longitudinal direction past the recording station. The rotational drive source means is comprised of an H-shaped or a U-shaped element. An element of either shape has two longitudinal members which are transversely bowed, and a connecting member. Relative longitudinal motion between the support assembly and the recording head assembly causes an increase or a decrease in the bows of the longitudinal members which in turn causes a rotational motion of the connecting member. The uni-directional drive is connected to this connecting member.

3,825,935
ELECTRICAL SIGNAL REGISTER

Joe M. Kortman, Vancouver, Wash., assignor to H. Dutton Hayward, Trustee of the Hilda Trusts, Tacoma; Joseph Schulein and Margaret A. Schulein, both of Vancouver, all of Wash., part interest to each

Filed Oct. 2, 1972, Ser. No. 293,846
Int. Cl. G01d *9/00*
U.S. Cl. 346—34 **8 Claims**

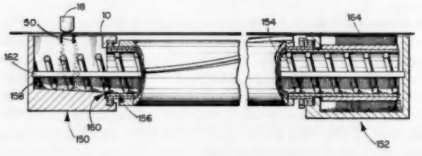


Apparatus in an electrical signaling system for registering or making a record of signals produced by a plurality of remote signaling devices. The apparatus includes memory circuitry that immediately notes, and remembers, which, if any, devices have transmitted signals, search circuitry which recurrently searches the memory circuitry for such information, and printing mechanism which is actuated immediately in response to information thus uncovered by the search circuitry to print a permanent record reflecting such information. Searching of the memory circuitry stops during intervals of operation of the printing mechanism.

3,825,936
TONER APPLICATOR FOR MAGNETIC PRINTING SYSTEM

Owen J. Ott, Brookfield Center; David W. Ginn, Newton, and Lester F. Miller, Jr., Bethel, all of Conn., assignors to Data Interface, Inc., Danbury, Conn.

Filed May 24, 1972, Ser. No. 256,417
Int. Cl. G01d *15/00, 15/12, 15/20*
U.S. Cl. 346—74 MP **8 Claims**

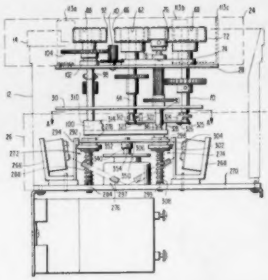


For use in a magnetic printing system in which magnetic toner powder is applied to recorded areas of a magnetic surface for subsequent transfer to a writing surface, apparatus for applying toner powder to the recording surface and for retaining the toner in an enclosed environment to prevent contamination of the printing apparatus. A substantially closed toner supply is employed having a first section confronting a first portion of a recording surface at which powder is applied, and a second section confronting a second portion of the recording surface at which residual amounts of toner are removed. A transport mechanism is provided to convey material removed from the recording surface from the second section back to the first section to replenish the toner supply and may include conveyor apparatus operative to convey toner powder away from the imprinting mechanism.

3,825,937
PRINT ELEMENT LIFTING ASSEMBLY FOR A TIME RECORDER

Dominick Tringali, and John W. Dillard, both of Columbia, S.C., assignors to Universal Business Machines, Incorporated, Columbia, S.C.

Division of Ser. No. 239,124, March 19, 1972, Pat. No. 3,793,641. This application July 16, 1973, Ser. No. 379,495
Int. Cl. G01d *15/24*
U.S. Cl. 346—141 **11 Claims**

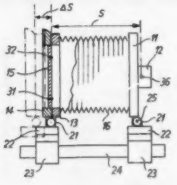


A recorder for automatically printing a record receiver, such as a card, with actual time and elapsed time. The recorder includes a chute assembly with cooperating electronic elements for automatically positioning a card therein prior to selectively operating a print actuator assembly. The last named assembly includes a plurality of marking assemblies carried by lift shafts and arranged to engage said record receiver. An actuator is provided for said lift shafts in conjunction with a trigger assembly that embodies a first coil member to release said actuator and a second coil member to recock said actuator.

3,825,938
PHOTOGRAPHIC FOCUSING SCREEN CAMERA

Carl Koch, Stetten, Switzerland, assignor to Sinar AG Schaffhausen, Feuerthalen, Switzerland

Filed Feb. 5, 1973, Ser. No. 329,870
Claims priority, application Switzerland, Feb. 4, 1972, 1679/72
Int. Cl. G03b *27/68*
U.S. Cl. 354—160 **18 Claims**



A photographic focusing screen camera having adjustably mounted 9 and image carriers and a focusing arrangement for varying the distance between them, a swinging arrangement for one of the carriers for swinging it about a swing axis relative to the other carrier, a first scale and pointer on the swinging arrangement for reading the adjusted swing position, a focusing screen on the image carrier with markings on the screen for determining the limitations of a measuring basis on the screen, a second scale and pointer on the focusing arrangement for a measuring angle, the second scale having angular graduations in accordance with the formula: $\sin \alpha = \Delta S/M$ wherein M is the measurement of the measuring basis; S

is difference of the focusing distance between the lens and the image points at the screen markings, necessary for obtaining sharp image of two parts of an object lying at different distances from the camera; and α is the angle by which the one carrier is to be swung in order to simultaneously produce a sharp image of the two different parts of the object on each of the markings.

3,825,939

FILM TRANSPORTING MECHANISM FOR PHOTOGRAPHIC CAMERAS

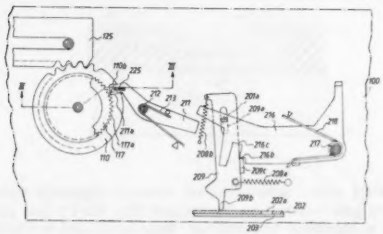
Dieter Engelsmann, Unterhaching; Dieter Maas, Munich, and Rolf Schroder, Baldham, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 28, 1973, Ser. No. 419,728

Claims priority, application Germany, Nov. 30, 1972, 2258639

Int. Cl. G03b *1/10, 1/16, 17/42*

U.S. Cl. 354—213 **10 Claims**



A still camera wherein a reciprocable actuating member turns the planet carrier of a planetary transmission whereby the ring gear of the transmission rotates the takeup reel in order to effect the transport of roll film by the length of a frame. When the transport of film by the length of a frame is completed, a control lever is automatically disengaged from a second gear which is rotatable by the sun gear of the transmission so that the second gear can rotate in response to further rotation of the planet carrier from a starting position. The camera release can be depressed only when the control lever is disengaged from the second gear and the planet carrier returns to its starting position.

3,825,940

FOCAL PLANE SHUTTER

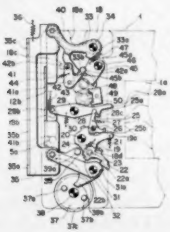
Tadao Hayami, Tokyo, Japan, assignor to Kabushiki Kaisha Koparu, Tokyo-To, Japan

Filed Oct. 3, 1972, Ser. No. 294,547

Claims priority, application Japan, Oct. 6, 1971, 46-78455

Int. Cl. G03b *9/36*

U.S. Cl. 354—241 **1 Claim**



A focal plane shutter having a shutter blade closing actuating member actuated by a release interlocking plate moved in association with the shutter release operation is disclosed. The closing actuating member is actuated through a release actuating lever, whose positional condition is controlled by a high-speed control cam capable of adjustment only by manual operation. The shutter may be adjusted at the time of its manufacture such as to exactly provide an intended exposure time.

3,825,941

RELEASE SWITCH DEVICE FOR A CAMERA

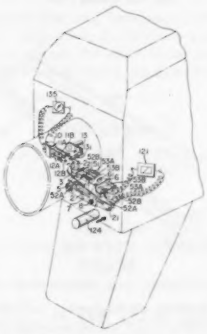
Inao Moriyama, Sagamihara, and Masamichi Toyama, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1973, Ser. No. 334,900

Claims priority, application Japan, Feb. 28, 1972, 47-24263; Feb. 28, 1972, 47-24264

Int. Cl. G03b *19/18, 17/38*

U.S. Cl. 354—266 **6 Claims**



The actuating member of a shutter release mechanism first operates a first set of switches while its progressive motion charges an arcuate spring to a dead point at which it reverses the direction in which it urges a second set of switches. Upon passing the dead point, the arcuate spring operates the second set of switches. The first set of switches may set exposure factors, turn on a tape recorder, or turn on lighting, for example. The second set of switches releases the camera shutter and may perform other functions too.

3,825,942

SHUTTER FOR CAMERAS

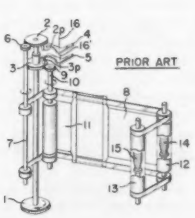
Hiroaki Watanabe, Fujisawa, and Soichi Nakamoto, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed July 31, 1973, Ser. No. 384,281

Claims priority, application Japan, Aug. 8, 1972, 47-79359

Int. Cl. G03b *9/62*

U.S. Cl. 354—267 **2 Claims**



In a camera shutter wherein high shutter speeds are controlled mechanically and low shutter speeds are controlled

electrically, there is provided a shutter opening control member and a shutter closing control member whose relative position is adjustable in accordance with a set shutter speed and which are movable together over a predetermined stroke, during which the two control members act on a shutter opening member and a shutter closing member in succession to control the shutter mechanically. For low shutter speeds, the closing control member during its predetermined stroke does not act on the closing member but actuates the latter member during an additional movement imparted to the closing control member by electromagnet means.

3,825,943

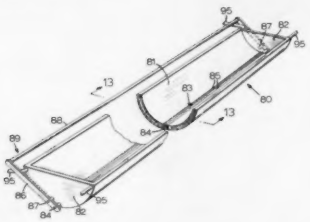
PHOTOGRAPHIC DEVELOPER APPARATUS

Raymond Joseph Masygan, Burlington, Ontario, Canada, assignor to Alex L. Clark Limited, Toronto, Ontario, Canada

Division of Ser. No. 80,836, Oct. 15, 1970, abandoned. This application Sept. 25, 1972, Ser. No. 292,103

Int. Cl. G03d *1/04*

U.S. Cl. 354—331 **6 Claims**



A trough for holding photographic processing chemicals. The trough comprises a rod which externally seals a longitudinal slot in the bottom of the trough, and a lever for moving the rod in an arcuate path away from the slot to allow rapid emptying of the chemicals from the trough.

3,825,944

AUTOMATIC TAPE LOADING DEVICE FOR MAGNETIC TAPE RECORDING AND/OR REPRODUCING APPARATUS

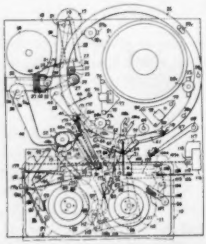
Yoshikazu Terao, Tokyo, and Junichi Ura, Yokohama, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Oct. 24, 1972, Ser. No. 299,666

Claims priority, application Japan, Oct. 25, 1971, 46-84565; Oct. 25, 1971, 46-84566; Oct. 25, 1971, 46-98899[U]; Oct. 25, 1971, 46-98900[U]; Oct. 25, 1971, 46-98901[U]; Oct. 25, 1971, 46-98902[U]; Oct. 25, 1971, 46-98903[U]; Mar. 2, 1972, 47-25188[U]

Int. Cl. G11b *15/66*

U.S. Cl. 360—85 **5 Claims**



A tape-autoloading type recording and/or reproducing apparatus comprises a tape out from the interior of a cassette to the outside thereof. The tape thus drawn out is pulled along a predetermined tape path thereby to wrap the same around the circumference of a guide drum. Motive power is transmitted from a single motive power source, first to the tape drawing out means and then to the tape pulling around means. The motive power transmitting means detects the arrival of the drawing out means approximately at a predetermined position and changes over to the pulling around means thereby stopping the motive power transmission to the drawing out means.

3,825,945

FIELD EFFECT SEMICONDUCTOR MEMORY APPARATUS WITH A FLOATING GATE

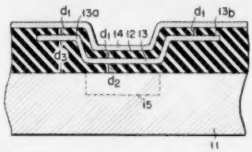
Fujio Masuoka, Ebina, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Feb. 27, 1973, Ser. No. 336,366

Claims priority, application Japan, Feb. 29, 1972, 47-20973

Int. Cl. H01l *11/14*

U.S. Cl. 357—23 **7 Claims**



A field effect semiconductor memory apparatus with a floating gate which is so constructed that when a gate electrode is impressed with voltage, there is created across the floating gate and substrate an electric field stronger than, or at least as strong as, that prevailing across the floating gate and gate electrode, whereby the floating gate is stored with information by being impressed with a relatively low level of voltage and the stored information is extinguished by giving rise to an avalanche breakdown across the substrate and at least either of the source and drain.

3,825,946

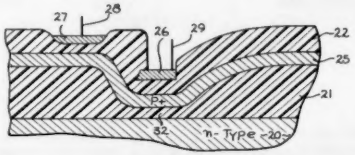
ELECTRICALLY ALTERABLE FLOATING GATE DEVICE AND METHOD FOR ALTERING SAME

Dov Frohman-Bentchkowsky, Los Altos, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 300,563, Oct. 25, 1972, abandoned, which is a continuation of Ser. No. 106,643, Jan. 15, 1971, abandoned. This application Oct. 19, 1973, Ser. No. 407,910

Int. Cl. H01l *11/14*

U.S. Cl. 357—23 **13 Claims**



A field effect device having a floating gate which can be charged or discharged electrically is disclosed. A pair of spaced apart regions in a substrate define a channel above which a floating gate is disposed and insulated from the channel. The regions have a conductivity type opposite to the substrate. A second gate is disposed above and insulated from the floating gate. The floating gate may be charged electrically by producing an avalanche breakdown at the junction formed by one of the spaced apart regions and the substrate causing the

passage of electrons through the insulation onto the floating gate. The floating gate may be discharged by the application of a voltage to the second gate relative to the spaced apart regions and substrate causing the passage of electrons from the floating gate through the insulation onto the second gate.

ERRATUM

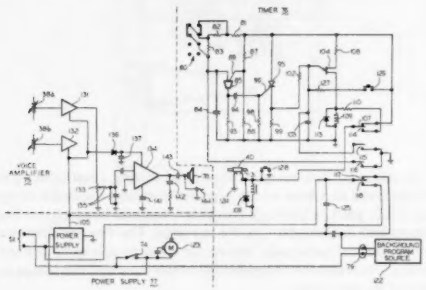
For Class 357—30 see:
Patent No. 3,825,807

3,825,947

METHOD AND MEANS FOR GIVING POINT OF SALE COMMERCIAL ANNOUNCEMENTS

Jerome Rubin, Englewood Cliffs, N.J., and Avery Lockner, Garnerville, N.Y., assignors to Jerome Rubin, Englewood Cliffs, N.J. and Michael H. Davis, Oak Brook, Ill.

Filed Feb. 16, 1973, Ser. No. 333,283
Int. Cl. G11b *15/02, 15/06*
U.S. Cl. 360—12 **17 Claims**



Point of sales advertisements are given by a tape recorder which periodically plays back prerecorded commercial announcements. In one embodiment, a tape recorder turns on and interrupts background program material. An interlock on the tape player prevents the playing of any unauthorized cassette or cartridge.

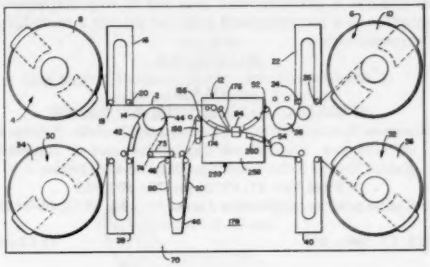
3,825,948

HIGH SPEED THERMAL DUPLICATION OF MAGNETIC TAPE

William B. Hendershot, III, San Jose; David Wald, Santa Clara, and Larry K. Whitlock, San Jose, all of Calif., assignors to Consolidated Video Systems, Inc., Santa Clara, Calif.

Filed Dec. 11, 1972, Ser. No. 313,710
Int. Cl. G11b *5/86*
U.S. Cl. 360—16 **35 Claims**

A system for high speed thermal duplication of a master magnetic tape onto a copy magnetic tape utilizing a master tape transport and a copy tape transport for guiding the tapes over an index plate having a hardened tape support surface along predetermined paths between supply stations and take-up stations, the master tape path and copy tape path being coincident over a predetermined length. A removable transfer station interposed in the paths of the master tape and the copy tape transports includes a releasable clamp which yieldingly biases the tapes together along the predetermined distance of path coincidence. A tape heater upstream from the pressure clamp heats the copy tape to a predetermined temperature prior to pressure contact against the master tape. The system provides an adjustable tape, tension control and equalization for the master and the copy tapes, a tachometer for measuring



the length of master and copy tapespassing the transfer area, feedback control responsive to the tachometer for adjusting tape tensions, and means for maintaining tape edges of differently sized tape in controlled contact with the index plate.

ERRATUM

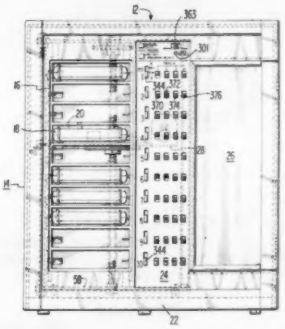
For Class 360—85 see:
Patent No. 3,825,944

3,825,949

CARTRIDGE CHANGER WITH CARTRIDGE SENSING MEANS

Gerald Dee Pyles, Indianapolis, Inc., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 17, 1971, Ser. No. 199,483
Int. Cl. G11b *23/10*
U.S. Cl. 360—91 **11 Claims**



A tape cartridge changer includes a plurality of tape cartridge receptacles which are each adapted to receive a tape cartridge and a movable structure which supports a portion of the changer playing mechanism. A movable mechanical stop is positioned adjacent each of the receptacles to block an inserted tape cartridge from being positioned in the path of travel of the movable structure. The movable structure as it moves toward each cartridge receptacle engages and moves the mechanical stop adjacent the cartridge receptacle away from its blocking position. This permits a tape cartridge in the cartridge receptacle to be brought into operative engagement with the portion of the tape changer playing mechanism supported by the movable structure.

Detector means at each of the cartridge receptacles sense the presence or absence of a tape cartridge in the receptacle.

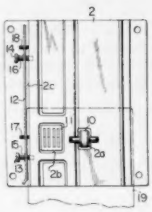
As the movable structure moves between the different cartridge receptacles, a switch mechanism mounted on the movable structure is actuated by the detector means when a cartridge is sensed as being present in the receptacle. The switch mechanism is operable when actuated to stop the movable structure at a predetermined point for playing a cartridge in the receptacle.

3,825,950

MAGNETIC CARD READER-RECORDER

Hiromasa Kobayashi; Yuzo Oguchi, and Kazuhiko Nakata, all of Suwa-gun, Nagano-ken, Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano-ken, Japan

Filed Nov. 17, 1972, Ser. No. 307,513
Claims priority, application Japan, Nov. 24, 1971, 46-94313
Int. Cl. G11b *5/56*
U.S. Cl. 360—109 **11 Claims**



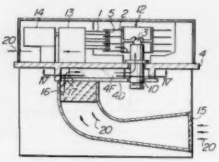
The apparatus comprises a card positioning member for correctly positioning a magnetic card in its movement along its path of travel adjustable in its position relative to the path of travel of the card. By adjusting the position of the card positioning member in accordance with the size and type of the magnetic card to be handled, it is possible to bring the magnetic tracks on the card into alignment with the magnetic head and cause the magnetic tracks to be correctly oriented relative to the magnetic gap of the magnetic head when the card moves along its path of travel while being maintained in pressing engagement with the card positioning member, whereby information can be magnetically recorded on the card or the information carried by the card can be magnetically read.

3,825,951

MAGNETIC DISC MEMORY

Toshio Katsumori; Shu Kawakami, and Isamu Kobayashi, all of Odawara, Japan, assignors to Kogyo Gijutsuin, Tokyo, Japan

Continuation of Ser. No. 110,156, Jan. 27, 1971, abandoned.
This application Nov. 20, 1972, Ser. No. 307,902
Claims priority, application Japan, Feb. 6, 1970, 45-9919
Int. Cl. G11b *23/02*
U.S. Cl. 360—133 **1 Claim**

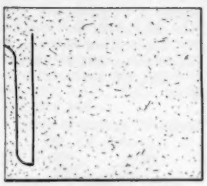


A magnetic disc memory apparatus having a multiplicity of fins secured to a base which supports a motor, a spindle carrying a disc pack, a carriage carrying magnetic head supporting means and an actuator for the carriage. The fins are disposed in the path of externally drawn air so as to minimize the difference between the temperature of the base and the temperature of the disc pack.

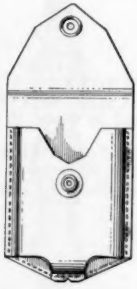
DESIGNS

JULY 23, 1974

232,134
BIB OR SIMILAR ARTICLE
Lars Marten Andersson, Molnlycke, Inga Gunilla Margaretha Strandell, Goteborg, and Eric Harry Ove Svard, Lerum, Sweden, assignors to Molnlycke AB, Goteborg, Sweden
Filed Apr. 30, 1973, Ser. No. 355,487
Claims priority, application Sweden Oct. 30, 1972
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—226

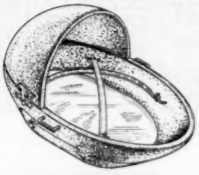


232,135
CIGARETTE LIGHTER CASE
Paul H. Dodson, Roanoke, Va., assignor to Dodson Specialties Incorporated, Roanoke, Va.
Filed Aug. 6, 1971, Ser. No. 169,892
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—400



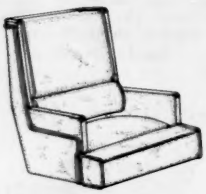
232,136
ARMCHAIR
Eric Sigfrid Persson, Horby, Sweden, assignor to Expo-Nord AB, Horby, Sweden
Filed Nov. 8, 1972, Ser. No. 304,680
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—6.7

232,137
BABY TRAVEL CRADLE
Gerald Joseph Peltier, 834 E. Philadelphia, Pomona, Calif. 91766
Filed Dec. 26, 1972, Ser. No. 318,019
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—14



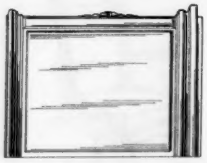
232,138
OPHTHALMIC CHAIR
John Truman Armbruster, Niagara Falls, N.Y., assignor to American Optical Corporation, Southbridge, Mass.
Filed Jan. 10, 1973, Ser. No. 322,349
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—22

232,139
COMBINED CHAIR AND LEG SUPPORT
Jose M. Rodreguez, Los Angeles, Calif., assignor to Beelner & Thomas, El Monte, Calif.
Filed Nov. 29, 1972, Ser. No. 310,639
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—37

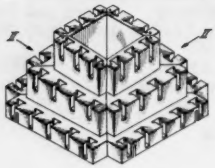


232,140
TRIPLE DRESSER OR SIMILAR ARTICLE
Huey T. Keller, High Point, N.C., assignor to Empire Furniture Company (a division of Vaughan Furniture Company, Incorporated), Johnson City, Tenn.
Filed Dec. 15, 1972, Ser. No. 315,355
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—154

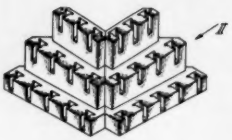
232,141
TRIPLE DRESSER OR SIMILAR ARTICLE
Huey T. Keller, High Point, N.C., assignor to Empire Furniture Company (a division of Vaughan Furniture Company, Incorporated), Johnson City, Tenn.
Filed Dec. 15, 1972, Ser. No. 315,527
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—154



232,142
TOOTHBRUSH DISPLAY STAND
Baard Spydevold, Oslo, Norway, assignor to A/S W. Jordan Borste & Penselfabrik, Oslo, Norway
Filed Nov. 17, 1972, Ser. No. 307,384
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—188



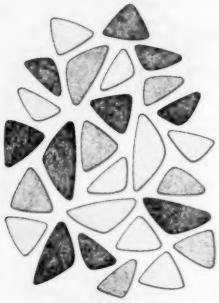
232,143
TOOTHBRUSH DISPLAY STAND
Baard Spydevold, Oslo, Norway, assignor to A/S W. Jordan Borste & Penselfabrik, Oslo, Norway
Filed Nov. 20, 1972, Ser. No. 308,242
Claims priority, application Norway Sept. 4, 1972
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—188



232,144
SHELF SPINDLE
James A. Ford, Sturgis, Mich., assignor to Kirsch Company, Sturgis, Mich.
Filed July 13, 1972, Ser. No. 271,260
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—195

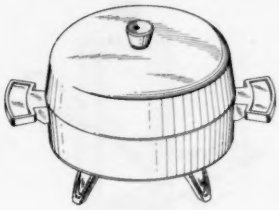
232,145
ADJUSTABLE HEADREST
John T. Armbruster, Niagara Falls, N.Y., assignor to American Optical Corporation, Southbridge, Mass.
Filed Dec. 7, 1972, Ser. No. 313,062
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—200

232,146
SET OF BATH TREADS
Roger L. Dean, Geneva, Ill., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation-in-part of design application Ser. No. 173,732, Aug. 20, 1971. This application Feb. 7, 1972, Ser. No. 224,386
Term of patent 14 years
Int. Cl. D6—*11*
U.S. Cl. D6—210

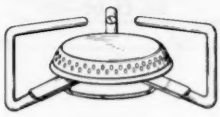


232,147
CLEATED ATTACHMENT FOR STREET SHOES
Natalie A. Frisch, 6900 Bobbyboyar Ave., and Hubert J. Vallis, 22942 Vost St., both of Canoga Park, Calif. 91304
Filed Feb. 28, 1973, Ser. No. 336,718
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—317

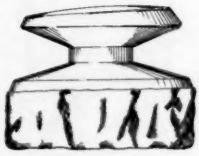
232,148
ELECTRIC CASSEROLE OR SIMILAR ARTICLE
Harold E. Yarrington, Eau Claire, Wis., assignor to National Presto Industries, Inc., Eau Claire, Wis.
Filed Aug. 31, 1972, Ser. No. 285,367
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—94



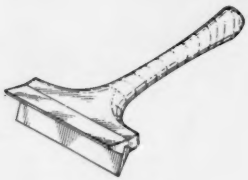
232,149
STOVE BURNER
Thomas A. Bergquist, Chicago, Ill., assignor to Olin Corporation
Filed May 30, 1972, Ser. No. 258,194
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—136



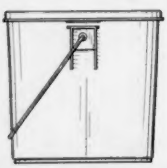
232,150
APPLICATOR FOR WAX
James C. McKinney, Greenville, S.C., and Ronald A. Peterson, New York, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.
Filed Feb. 23, 1972, Ser. No. 228,794
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—178



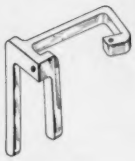
232,151
COMBINED ICE SCRAPER AND MOISTURE REMOVER
Baard Spydevold, Oslo, Norway, assignor to A/S W. Jordan Borste & Penselfabrik, Oslo, Norway
Filed Sept. 14, 1971, Ser. No. 180,539
Term of patent 14 years
Int. Cl. D7—*99;* D8—*05*
U.S. Cl. D7—184

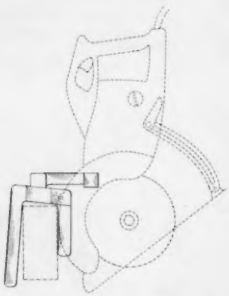


232,152
COMBINED CONTAINER AND CLOSURE THEREFOR
William H. Roper, Los Angeles, Robert E. Roper, Los Alamitos, and Charles R. Roper, Huntington Beach, Calif., assignors to Frank Roper, North Hollywood, and Ralph A. Miller, Van Nuys, Calif., fractional part interest to each
Filed May 17, 1972, Ser. No. 254,348
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—187



232,153
RAFTER SUPPORTABLE ATTACHMENT FOR A CIRCULAR SAW
Jerry C. Pepper, Rte. 1, Box 1513, Elk Grove, Calif. 95624
Filed June 8, 1972, Ser. No. 261,143
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—70

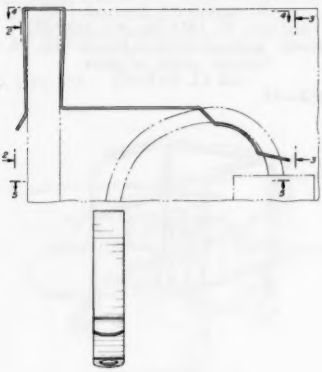




232,154
DRAPERY SLIDE FOR A CURTAIN ROD
Samuel Galietti, 1360 NE. 204th Terrace, North Miami Beach, Fla. 33162
Filed June 29, 1973, Ser. No. 375,088
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—239

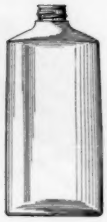
232,155
DRAPERY SLIDE FOR A CURTAIN ROD
Samuel Galietti, 1360 NE. 204th Terrace, North Miami Beach, Fla. 33162
Filed June 29 ,1973, Ser. No. 375,090
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—239

232,156
SUPPORT FOR TOILET TANK REFILL TUBE
Adolf Schoepe, 1620 N. Raymond Ave., Fullerton, Calif. 92631, and Fredric E. Schmuck, 427 Fernhill Lane, Anaheim, Calif. 92806
Filed Mar. 6, 1972, Ser. No. 232,336
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—259

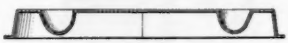


232,157
COMBINED BOTTLE AND SUPPORT CLIP THEREFOR
Fred J. Jacobs, Fairlawn, N.J., assignor to Knomark, Inc., Jamaica, N.Y.
Filed Aug. 30, 1972, Ser. No. 284,923
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—10

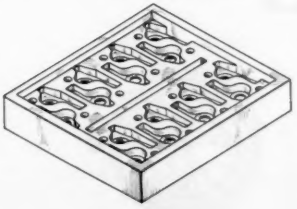
232,158
BOTTLE
Warren J. Luedtke, Racine, Wis., assignor to S. C. Johnson & Sons, Racine, Wis.
Filed Aug. 14, 1972, Ser. No. 280,707
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—167



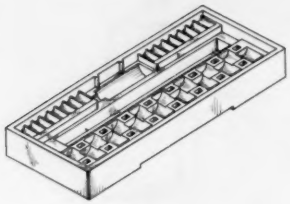
232,159
EYELASH CONTAINER
Elizabeth Benjamin, Kingston-upon-Thames, England, assignor to Crystal Products Company Limited, Surbiton, Surrey, England
Filed Sept. 28, 1971, Ser. No. 184,656
Claims priority, application Great Britain July 27, 1971
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—171



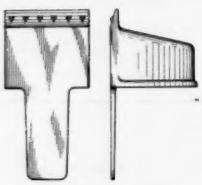
232,160
COMBINED PACKAGING AND DISPLAY CONTAINER FOR AUTOMOTIVE ROCKER ARMS
Robert G. Gibson, North Palm Beach, Fla., assignor to Crane Cams Incorporated, Hallandale, Fla.
Filed June 21, 1972, Ser. No. 264,946
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—185



232,161
COMBINED PACKAGING AND DISPLAY CONTAINER FOR AUTOMOTIVE CAMS
Robert G. Gibson, North Palm Beach, Fla., assignor to Crane Cams Incorporated, Hallandale, Fla.
Filed June 21, 1972, Ser. No. 264,947
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—185

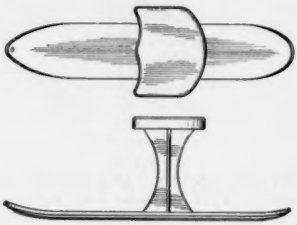


232,162
COMBINED ICE SCRAPER AND OVERCAP
Laurel E. Carr, Chicago, Ill., assignor to The Bell Company, Inc., Chicago, Ill.
Filed Sept. 18, 1972, Ser. No. 289,808
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—261



232,163
WATCH CASE
Renaud Langer, Neuchatel, Switzerland, assignor to Ebauches Electroniques SA, Neuchatel, Switzerland
Continuation-in-part of abandoned design application Ser. No. 165,437, July 22, 1971. This application Oct. 26, 1971, Ser. No. 192,694
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—37

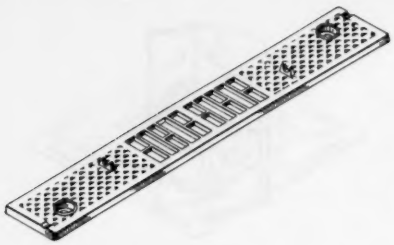
232,164
SKI SKOOTER
John E. Bemis II, Keewatin, Minn. 55769, and George J. Knezovich, 3842 2nd Ave. W., Hibbing, Minn. 55746
Filed Apr. 9, 1973, Ser. No. 349,558
Term of patent 7 years
Int. Cl. D21—*02*
U.S. Cl. D12—10



232,165
MOBILE FRAME FOR SUPPORTING A CHEMICAL CLOSET OR THE LIKE
Montague Hiller, 20 Carrington Ave., Borehamwood, England
Filed Aug. 28, 1972, Ser. No. 283,957
Claims priority, application Great Britain Mar. 20, 1972
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—25

232,166
DESIGN FOR MOBILE CART
John P. Salsgiver, West Acton, Mass., assignor to United Technical Corporation, West Concord, Mass.
Filed Nov. 22, 1971, Ser. No. 201,249
Term of patent 14 years
Int. Cl. D12—*02*; D6—*04*
U.S. Cl. D12—27

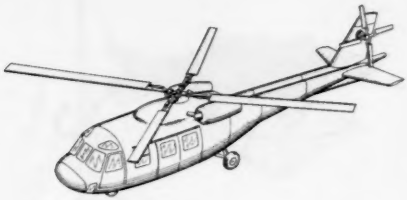
232,167
BOAT STORAGE COMPARTMENT LID OR THE LIKE
Carl R. Cordell, Jr., 215 Idlewood Drive, Hot Springs, Ark.
Filed Dec. 8, 1972, Ser. No. 313,406
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D12—70



232,168
HELICOPTER
Ray D. Leoni, Woodbridge, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed June 30, 1972, Ser. No. 267,819
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—73

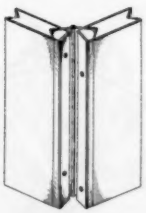
232,169
ICE BOAT OR THE LIKE
Robert Rounds, Jr., 1706 Brentwood Lane, Wheaton, Ill. 60187
Filed Jan. 31, 1973, Ser. No. 328,429
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—64

232,170
TWIN ENGINE HELICOPTER
John Diamond, West Chester, and David Walter Harry and John Jacob Schneider, Media, Pa., assignors to The Boeing Company, Seattle, Wash.
Filed Dec. 26, 1972, Ser. No. 318,290
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—73



232,171
TIRE OR SIMILAR ARTICLE
Gernot Arendt, Traiskirchen, Austria, assignor to Firma Deutsche Semperit Gummiwerk G.m.b.H., Munich, Germany
Filed July 29, 1971, Ser. No. 167,539
Claims priority, application Germany Feb. 10, 1971; Mar. 26, 1971
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—142

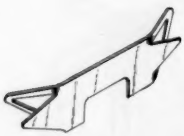
232,172
HINGED FREE-STANDING PARTITION
Steve Themis, 130 9th St., San Francisco, Calif. 94103
Filed June 14, 1971, Ser. No. 152,743
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—1 K



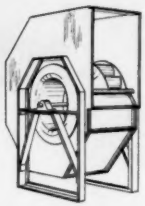
232,173
FISH LURE
Earl E. Miller, Knoxville, Tenn., assignor to The Brunswick Corporation, Skokie, Ill.
Filed Oct. 22, 1971, Ser. No. 192,723
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

232,174
MODULE FOR A FILTER MEDIA
Joseph N. La Borde, 1801 Ormandy Drive, Baton Rouge, La. 70808
Filed Mar. 12, 1973, Ser. No. 340,219
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4

232,175
SUPPORT FOR THE HEATING ELEMENT OF A RADIANT HEATER OR THE LIKE
Ralph Santoro, Verona, Pa., assignor to Emerson Electric Co., St. Louis, Mo.
Filed May 5, 1972, Ser. No. 250,843
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—127



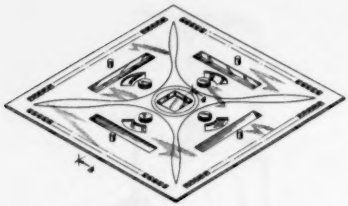
232,176
FAN
George T. Brockman, Stoddard, Richard W. Kabat, Genoa, and Ronald J. Lievens, Onalaska, Wis., assignors to The Trane Company, La Crosse, Wis.
Filed May 8, 1972, Ser. No. 251,574
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—162



232,177
FLAG STAND
Joseph S. Craig, Marion, Iowa (530 4th Ave. E., Cresco, Iowa 52136)
Filed Sept. 5, 1972, Ser. No. 286,564
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D29—17 A

232,178
NOVELTY UNICORN HORSESHOE OR THE LIKE
Jack P. McDaniel, Cumberland, N.C. (514 Owen Drive, Fayetteville, N.C. 28304)
Filed Nov. 12, 1971, Ser. No. 198,499
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 GP

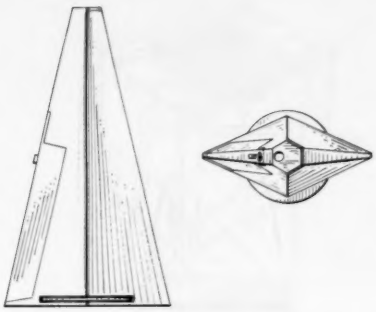
232,179
GAME BOARD
Murray Zaintz, 60 Tynan St., Staten Island, N.Y. 10312
Filed Jan. 15, 1973, Ser. No. 323,851
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



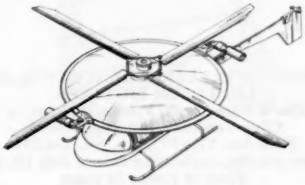
232,180
TILTABLE TOY
Hermann Neuhierl, 36 Waldestrasse, 8510 Furth, Bavaria, Germany
Filed Oct. 29, 1971, Ser. No. 194,102
Claims priority, application Germany July 5, 1971
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 A

232,181
TENNIS GAME TETHER BALL
Raymond J. Lohr, Robert Thomas Auer, and Laurie Jay Campbell, Erie, Pa., assignors to Louis Marx & Co., Inc., New York, N.Y.
Filed Mar. 13, 1972, Ser. No. 234,444
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 P

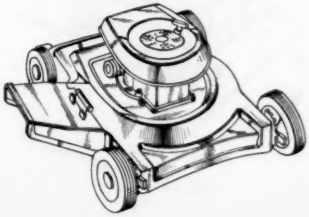
232,182
KALEIDOSCOPE
Alfred A. Orans, 225 Ellison Ave., Westbury, N.Y. 11590
Filed Sept. 8, 1972, Ser. No. 287,558
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 A



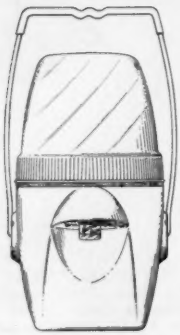
232,183
TOY HELICOPTER
Richard E. Reed, 6396 Condor Court, Ventura, Calif. 93003
Filed Oct. 10, 1972, Ser. No. 296,190
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 KK



232,184
COMBINED HOUSING, DEFLECTOR AND MOTOR SHROUD ARRANGEMENT FOR A ROTARY LAWNMOWER
Larry M. Cognata, Nashville, Tenn., assignor to The Murray Ohio Manufacturing Co., Nashville, Tenn.
Filed Jan. 19, 1973, Ser. No. 324,969
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1 B

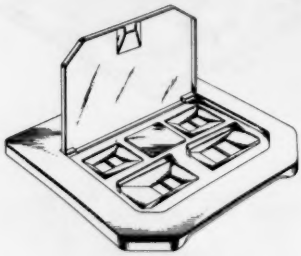


232,185
ELECTRIC LANTERN
Nolan K. Rhoades, Beloit, and Whitley Pemberton, Stoughton, Wis., assignors to ESB Incorporated, Philadelphia, Pa.
Filed Nov. 13, 1972, Ser. No. 306,004
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 R



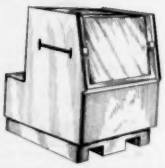
232,186
COMBINED ELECTRIC GENERATOR AND LIGHT FOR BICYCLES
Pierre Cibie, Paris, France, assignor to Cibie Vendome, Bobigny, France
Filed Jan. 17, 1973, Ser. No. 324,251
Claims priority, application France July 18, 1972
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—24 A

232,187
ACCESS LID FOR AN AUTOMATIC CLOTHES WASHER UTILIZING A WASH ADDITIVE DISPENSER, OR SIMILAR ARTICLE
Perry C. McCollom, Jr., Louisville, Ky., assignor to General Electric Company
Filed Feb. 15, 1973, Ser. No. 332,612
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D49—1 A

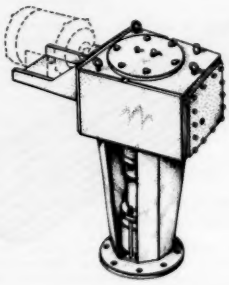


232,188
ELECTRONIC COMPARATOR
Robert Sramek, Sterling Heights, Mich., assignor to Etronic Corporation, Detroit, Mich.
Filed Oct. 27, 1972, Ser. No. 301,630
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—6 R

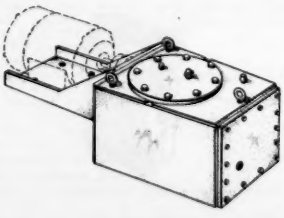
232,189
ETCHER CABINETS
Daniel L. Goffredo, Riverton, N.J., and Conrad Dale Shakley, Spring Mills, Pa., assignors to Chemcut Corporation, State College, Pa.
Continuation-in-part of abandoned design application Ser. No. 194,798, Nov. 1, 1971. This application Feb. 3, 1972, Ser. No. 223,387
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D55—1 R



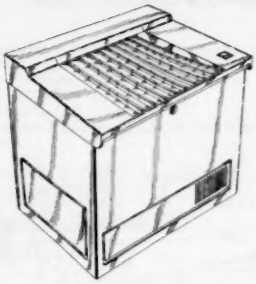
232,190
RIGHT ANGLE DRIVE AND PEDESTAL
John G. Fenic, Donald L. Kime, and William C. Raridan, Dayton, and Read C. Viemeister, Yellow Springs, Ohio, assignors to Chemineer, Inc., Dayton, Ohio
Filed Dec. 18, 1972, Ser. No. 315,923
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D55—1 D



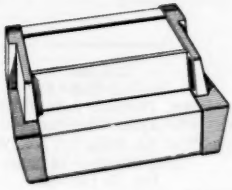
232,191
RIGHT ANGLE DRIVE
John G. Fenic, Donald L. Kime, and William C. Raridan, Dayton, and Read C. Viemeister, Yellow Springs, Ohio, assignors to Chemineer, Inc., Dayton, Ohio
Filed Dec. 18, 1972, Ser. No. 316,069
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D55—1 D



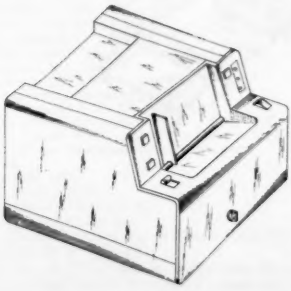
232,192
PHOTOGRAPHIC FILM SHEET PROCESSOR
Ralph M. Vigna, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed July 14, 1972, Ser. No. 271,845
Term of patent 14 years
Int. Cl. D16—*04*
U.S. Cl. D61—1 Q



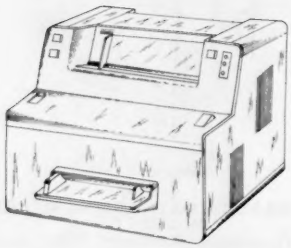
232,193
COVER FOR A DATA TYPING MACHINE OR THE LIKE
Allen D. Alexander, Columbus, Ohio, assignor to Industrial Nucleonics Corporation
Filed May 11, 1972, Ser. No. 252,522
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D64—11 R



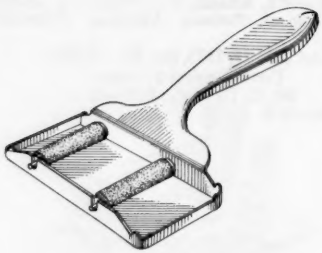
232,194
TELLER STATION PRINTER
Ronald I. Conway, Port Ewen, Robert V. Jones, Kingston, and David L. Schaum, Woodstock, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed June 14, 1973, Ser. No. 370,062
Term of patent 14 years
Int. Cl. D14—*02;* D18—*02*
U.S. Cl. D64—11 B



232,195
TELLER STATION PRINTER
Ronald I. Conway, Port Ewen, Robert V. Jones, Kingston, and David L. Schaum, Woodstock, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed June 14, 1973, Ser. No. 370,099
Term of patent 14 years
Int. Cl. D14—*02;* D18—*02*
U.S. Cl. D64—11 B

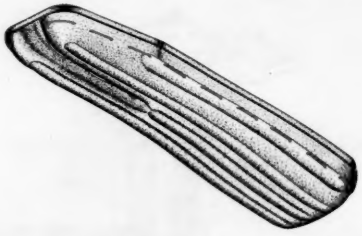


232,196
PAINT ROLLER
John F. Mason, Phoenix, Ariz. (Building 450–B, Mickley Run Apts., Whitehall, Pa. 18052)
Filed Nov. 15, 1972, Ser. No. 306,534
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D64—18



232,197
POCKET CLIP FOR WRITING INSTRUMENT
Toshihiro Nakata, Tokyo, Japan, assignor to Platinum Fountain-Pen Co., Ltd., Tokyo, Japan
Filed Dec. 3, 1971, Ser. No. 204,790
Claims priority, application Japan June 5, 1971; July 22, 1971
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D74—17 A

232,198
LITTER
Thomas L. Thompson, 3135 Bayside Drive, Corona Del Mar. Calif. 92014
Filed Mar. 24, 1972, Ser. No. 238,013
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D83—1 E



232,199
ELECTRIC SHAVER
Hermann R. Schaefer, Bridgeport, Conn., assignor to Sperry Rand Corporation, New York, N.Y.
Original design application Nov. 16, 1970, Ser. No. 25,997. Divided and this application Aug. 30, 1972, Ser. No. 280,744
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3 A

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23D DAY OF JULY, 1974

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A-T-O Inc.: *See—*
Fechheimer, Paul R., 3,825,043.
A-1 Engineering, Inc.: *See—*
Neuman, Gordon E., 3,825,123.
AB Bygg-och Transportekoneone (BF): *See—*
Bryntse, Anders Ivar; and Berkestad, Karl Erik, 3,824,897.
AB Cold-Bound Pellets: *See—*
Kihlstedt, Per Gudmar, 3,825,638.
Abate, Loris: *See—*
Schon, Nutrizio Maria; and Abate, Loris, 3,824,627.
Abernathy, James D.: *See—*
Marus, Louis J.; and Abernathy, James D., 3,825,921.
Acevedo, Raul. Adjustable split artificial tooth with micrometer wheel means for synamically adjusting the mestodistal tooth dimension. 3,824,691, Cl. 32-71.000.
ACF Industries, Incorporated: *See—*
Kalsi, Manmohan S., 3,825,030.
Achermann, Franz: *See—*
Achermann, Werner; and Achermann, Franz, 3,825,441.
Achermann, Werner; and Achermann, Franz, to Boise Cascade Corporation. Method for impregnating corrugated cardboard, and resultant product. 3,825,441, Cl. 117-119.000.
Acrometal Products, Inc.: *See—*
Steinback, Clarence I., 3,825,277.
Action Communication Systems, Inc.: *See—*
Allen, Chester C., Jr., 3,825,905.
Addressograph-Multigraph Corporation: *See—*
Kolibas, James A., 3,825,338.
Van Acker, John J., 3,824,922.
Zimmer, Robert E., 3,825,249.
Adelmann, Robert Witsenhausen, to Societe Anonyme de Recherches de Mecanique Appliquee. Ski-stick and associated looped carrier strap. 3,825,276, Cl. 280-11.37h.
Agatsuma, Takashi: *See—*
Kikuchi, Akira; Agatsuma, Takashi; and Anzai, Akio, 3,825,454.
Agfa-Gevaert Aktiengesellschaft: *See—*
Engelsmann, Dieter; Maas, Dieter; and Schroder, Rolf, 3,825,939.
Heilmann, Max, 3,825,425.
Agfa-Gevaert N.V.: *See—*
Pollett, Robert Joseph; Philippaerts, Herman Adelbert; Vandenberghe, Antoon Leon; and Willems, Jozef Frans, 3,825,426.
Agg, Michael John: *See—*
McMurtry, David Roberts; and Agg, Michael John, 3,825,370.
Ahmed, Adel Abdel Aziz, to RCA Corporation. Temperature-sensitive control circuit. 3,825,778, Cl. 307-310.000.
Ahrens, Gerhard W. Production of stable, nonhydrous homogeneous in natural and mineral oils soluble vitamin-E-active cream-base-coesters of the mineral-oil-insoluble D-alpha-tocopheryl-acid-succinate with anhydrous oils. 3,825,563, Cl. 260-345.500.
Ainsworth, Richard Allan, to International Business Machines Corporation. Contact bounce eliminator circuit with low standby power. 3,825,772, Cl. 307-274.00a.
Ajinomoto Co., Inc.: *See—*
Kubota, Koji; Yoshihara, Yasuhiko; Hirakawa, Hayao; Kamijo, Hirotaka; Nosaki, Shigeki; Yoshinaga, Fumihiro; Okumura, Shinji; and Okada, Hiroshi, 3,825,472.
Tazuke, Hideo; Kitahara, Toshio; and Kageyama, Hiroo, 3,825,559.
Ajupov, Rustem Nurievich: *See—*
Starostin, Jury Stepanovich; Plokhov, Viktor Ivanovich; Erokhov, Veniamin Kuzmich; Ivanov, Vladimir Prokopievich; Krotkov, Vladimir Nikolaevich; Anisimov, Albert Viktorovich; Ajupov, Rustem Nurievich; and Golovinov, Mikhail Fedortovich, 3,824,832.
Akamatsu, Takashi; Koga, Koichi; Kondo, Mitsuru; Miyake, Makoto; and Iwasaki, Hiroshi, to Sumitomo Chemical Company. Fluoran compounds. 3,825,561, Cl. 260-335.000.
Aktiebolaget Bofors: *See—*
Andersson, John-Erik, 3,824,846.
Albertzart, R. Richard, to Hayes-Albion Corporation. Lightweight fan. 3,825,369, Cl. 416-229.000.
Alexander, Donald Ray. Serial number embossing apparatus. 3,824,921, Cl. 101-19.000.
Alexander, Herman: *See—*
Langwell, John D., 3,824,720.
Alfa Farmaceutici, S.p.A.: *See—*
Gargiuolo, Francesco, 3,825,473.
Alford, Ricker, Jr. Alternate light lighting fixture. 3,825,769, Cl. 307-157.000.
Allaben, Charles M., Jr., to Borg-Warner Corporation. Shaft lock device. 3,825,312, Cl. 308-236.000.
Allam, Elsayed: *See—*
Katz, Carlos; Garcia, Felipe; and Allam, Elsayed, 3,825,670.
Allen, Chester C., Jr., to Action Communication Systems, Inc. Binary synchronous communications processor system and method. 3,825,905, Cl. 340-172.500.
Allen, Gerald Dean: *See—*
Santos, Anthony R.; Santos, Ontario R.; and Allen, Gerald Dean, 3,824,769.
Allen, Scott D.: *See—*
Hall, Wayne C., 3,824,738.
Allied Chemical Corporation: *See—*
Valentine, John P.; and Luley, Wilbert E., 3,824,766.
Allis, Robert F.: *See—*
Kingsley, William; and Allis, Robert F., 3,825,724.
Allis-Chalmers Corporation: *See—*
Collins, Eldred L., 3,825,072.
Hansen, Kenneth N., 3,825,283.
Lesperance, Lawrence M.; Drewry, Hugh S.; and Vegners, Gunars, 3,824,694.
Alloway Manufacturing, Inc.: *See—*
Eisenhardt, Fred W.; and Ellingson, Hartley N., 3,825,358.
Alps Electric Co., Ltd.: *See—*
Koizumi, Yasumi, 3,825,862.
Altenschopfer, Theodor; and Batka, Heimold, to Deutsch Gold- und Silber-Scheideanstalt vormals Roessler. Dishwashing detergent composition for use in dishwashing machines. 3,825,498, Cl. 252-99.000.
Altman, Richard M.; and Rosenblatt, Jerome J. Zoom lens optical system for infrared wavelengths. 3,825,315, Cl. 350-2.000.
Aluminum Company of America: *See—*
Scherf, Thomas W., 3,824,749.
Smith, Herman W.; and Berka, Paul H., 3,825,811.
Alves, Ronald V.: *See—*
Buchanan, Robert A.; Alves, Ronald V.; Maple, T. Grant; and Sobon, Leon E., 3,825,436.
Alvi, Syed M. S.: *See—*
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Amalgamated Dental Company, Limited, The: *See—*
Foster, John; and Walker, Richard John, 3,825,518.
Amalgamated Dental Company, The: *See—*
Paige, Anthony Thomas, 3,825,002.
Amann, John A. Sectionalized laminate strip structure. 3,825,463, Cl. 161-36.000.
Amberg, Ralph G., to Owens-Illinois, Inc. Apparatus for testing and sorting cups. 3,824,840, Cl. 73-45.300.
Amdahl Corporation: *See—*
Larsen, Dee E.; and Clements Michael R., 3,825,895.
Amelunxen, Bernd, to BBC Brown Boveri & Company Limited. Clamped disc type semiconductor assembly with built-in contact pressure gage. 3,825,804, Cl. 317-234.00r.
Amemiya, Kiyoshi; Kondou, Masakazu; Yamazaki, Kazuhiko; and Kanai, Fumio, to Hitachi, Ltd. Local oscillator for use in a VHF tuner for a television receiver. 3,825,858, Cl. 331-117.00r.
American Can Company: *See—*
Meyers, George Leroy, 3,825,169.
American Cyanamid Company: *See—*
Lucas, Howard Robert; and Olsen, Robert Nils, 3,825,515.
American Hoist & Derrick Company: *See—*
Crook, Edward J., Jr., 3,825,356.
American Home Products Corporation: *See—*
Nudelman, Abraham; and McCaully, Ronald J., 3,825,533.
American Hospital Supply Corporation: *See—*
Burg, Donald E., 3,825,178.
American Optical Corporation: *See—*
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Shaw, Robert; and Robinson, Charles C., 3,825,500.
American Standard, Inc.: *See—*
Mahon, Roger, 3,824,853.
American Telecommunications Corporation: *See—*
Tucker, Council A., 3,825,882.
Amery, Ernest. Internal combustion engine. 3,824,970, Cl. 123-45.00r.
Ames, William A.; and Ward, James J., to Eastman Kodak Company. Purification of a,a-disubstituted-β-propiolactones. 3,825,573, Cl. 260-343.900.
AMF Incorporated: *See—*
Cristiani, Athos, 3,825,105.
Neville, Richard E. G., 3,824,704.
Amoco Production Company: *See—*
Murphy, Robert P.; and Froning, H. Robert, 3,825,752.
Veatch, Ralph W. Jr., 3,825,071.
Amodei, Juan Jose, to RCA Corporation. Apparatus for providing an optical system using adaptive holographic components. 3,825,316, Cl. 350-3.500.
AMP Incorporated: *See—*

Battaglia, Dino; Bergonzi, Mario; Teagno, Wladimiro; and Trevisiol, Franco, 3,825,880.
Forney, Edgar Wilmot, Jr., 3,824,686.
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Amsted Industries Incorporated: *See—*
Riggs, Peter Philip, 3,824,777.
Anderson Corporation: *See—*
Peterson, Kenneth L., 3,825,046.
Anderson, Glenn A., Sr., to Sanders Associates, Inc. High intensity modulated infrared radiation source. 3,825,764, Cl. 250-495.000.
Anderson, John Ernest, to Midland Industrial Computing Limited. Textile machines. 3,825,900, Cl. 340-172.500.
Anderson, Richard N., to Anderson, V. E., Mfg., Co. Window structure. 3,824,753, Cl. 52-203.000.
Anderson, V. E., Mfg., Co.: *See—*
Anderson, Richard N., 3,824,753.
Andersson, John-Erik, to Aktiebolaget Bofors. Holder for force transducer. 3,824,846, Cl. 73-100.000.
Ang, Leoncio T.: *See—*
Carp, Ralph W.; Ingels, Ward A.; and Ang, Leoncio T., 3,825,307.
Angelbeck, Albert W.; and Wisner, George R., to United Aircraft Corporation. Parallel optical stage laser systems. 3,825,845, Cl. 330-4.300.
Anisimov, Albert Viktorovich: *See—*
Starostin, Jury Stepanovich; Plokhov, Viktor Ivanovich; Erokhov, Veniamin Kuzmich; Ivanov, Vladimir Prokopievich; Krotkov, Vladimir Nikolaevich; Anisimov, Albert Viktorovich; Ajupov, Rustem Nurievich; and Golovinov, Mikhail Fedortovich, 3,824,832.
Antoniou, Anthony A., to Anvan Industries, Inc. Column connector system. 3,824,750, Cl. 52-79.000.
Anvan Industries, Inc.: *See—*
Antoniou, Anthony A., 3,824,750.
Anzai, Akio: *See—*
Kikuchi, Akira; Agatsuma, Takashi; and Anzai, Akio, 3,825,454.
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Aoyama, Taizo; and Kamosawa, Katsuya, to Nippon Carbureter Co. Ltd. Fuel feeding and charge forming apparatus. 3,825,237, Cl. 261-35.000.
Appleman, James D. Staple remover. 3,825,226, Cl. 254-28.000.
Applicator Brush Company, Inc.: *See—*
Seidler, David, 3,825,021.
Aquila, Christopher J. Whistle device. 3,824,949, Cl. 116-137.00r.
Araki, Yozo: *See—*
Hayase, Masao; Hayasaka, Yoshiyuki; and Araki, Yozo, 3,825,750.
Armstrong, Richard James, to Decalock Limited. Latch bolt and keep assembly. 3,825,289, Cl. 292-2.000.
Arnaud, Fabian. Container and detachable handle structure therefor. 3,825,151, Cl. 220-94.00r.
Aronson, Theodore F., to Kristel, Ira B. Type slugs clamp in a printing plate cylinder. 3,824,932, Cl. 101-377.000.
Arvin Industries, Inc.: *See—*
Kasprzak, Vincent D., 3,825,677.
Asahi Glass Company, Ltd.: *See—*
Yamamoto, Takashi; and Uchijima, Katsuo, 3,825,510.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Takeda, Isao; Mizuno, Masayuki; Sugawara, Toshiaki; Shimojima, Yukiji; and Horiguchi, Sadayuki, 3,825,660.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Takahashi, Yasuo, 3,825,321.
Uno, Naoyuki, 3,825,352.
Asahi-Dow Limited: *See—*
Izawa, Shinichi; Harada, Kazuhiko; Mizushiro, Ken; Ishihara, Miyoko; and Nakanishi, Atsuo, 3,825,521.
Asai, Nobuyoshi: *See—*
Ono, Yoshio; Sekine, Chiu; Takaoka, Naotoshi; and Asai, Nobuyoshi, 3,825,870.
Ashida, Takao; Kurihara, Osamu; Nawata, Kiyoshi; Shinoki, Takanori; Fujita, Yutaka; Yamashita, Gentaro; and Saiki, Noritsugu, to Teijin Limited. Production of polyamides from methyl substituted phthalic acid by melt polymerization in the presence of reducig phosphorus acid compound. 3,825,508, Cl. 260-78.00r.
Ashland Oil, Inc.: *See—*
Kmecak, Ronald A.; and Kovach, Stephen M., 3,825,613.
Patrick, Ralph R.; Kmecak, Ronald A.; and Kovach, Stephen M., 3,825,503.
Ashton, Harold P.: *See—*
Swett, James B.; and Ashton, Harold P., 3,825,049.
Ashworth, Billy R.; and Merrill, John T., IV 4 United States of America, National Aeronautics and Space Administration. Apparatus for applying simulator g-forces to an arm of an aircraft simulator pilot. 3,824,707, Cl. 35-12.00e.
Ateliers des Charmilles S.A.: *See—*
Marendaz, Georges-Andre, 3,825,714.
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Smirnov, Mikhail Dmitrievich; Ershov, Boris Alexandrovich; Savitsky, Vladilen Nikolaevich; Breev, Boris DmitrievICH; Atkarsky, Anatoly Alexandrovich; Shardakov, Svyatoslav Viktorovich; Sinajuk, David Aronovich; Stukalov, Vladimir Nikolaevich; and Puzynya, eonid Vasilievich, 3,824,642.
Atlantic Richfield Company: *See—*
Burk, Emmett H.; and Fuger, Karl E., 3,825,554.
Atlantic Service Co., Inc.: *See—*
McManus, Walter K.; Bouffard, Joseph T.; and Harris, Lennard D., 3,825,047.
Atwal, Manmohan S.; and Shipkowski, Eugene R., to Squibb, E. R., & Sons Inc. Process for preparing α-amino-cyclohexadienylalkylene penicillins. 3,825,530, Cl. 260-239.100.
Atwood, Elbridge L.: *See—*
Call, Donald H.; Atwood, Elbridge L.; Cary, Joseph A.; and Surette, James D., 3,825,494.
Auer, John H., Jr.: *See—*
Sibley, Henry C.; Auer, John H., Jr.; and Smith, Willis R., 3,825,744.
Augat, Inc.: *See—*
Damon, Neil F.; Laurence, Robert S.; and Hoy, Ralph C., 3,825,876.
Aumuller, Walter: *See—*
Weber, Helmut; Aumuller, Walter; Weyer, Rudi; Muth, Karl; and Schmidt, Felix Helmut, 3,825,665.
Aust, John J.; and Gray, Charles D., to Owens-Illinois, Inc. Double-bottom, on-piece beverage case. 3,825,170, Cl. 229-37.00e.
Automatic Steam Products Corp.: *See—*
Miranker, Samuel H., 3,824,719.
Automation fur Grafische Technik BmbH: *See—*
Gartner, Karlheinz, 3,824,907.
Automotive Products Company Limited: *See—*
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Azuma, Kishiro: *See—*
Kato, Hiroyuki; Tsuzi, Isao; Azuma, Kishiro; and Tatemichi, Hidemaro, 3,825,580.
Bacal, Martha; and Reichelt, Walter, to Commissariat a l'Energie Atomique. Process for exchange of charge and apparatus for carrying out the process. 3,825,790, Cl. 313-362.000.
Bach, Bert; and Lemcke, Robert, to Pure Way Corporation. Self-contained water closet and digester. 3,824,632, Cl. 4-12.000.
Bachmann, Horst, to Langenstein & Schemann Aktiegesellschaft. Forging press. 3,824,833, Cl. 72-367.000.
Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Uhl, Guenter; Oppenlaender, Knut; Fikentscher, Rolf; and Mueller, Richard, 3,825,431.
Bagshawe, Kenneth Dawson. Performance of routine chemical reactions in compartmentalized containers. 3,825,410, Cl. 23-230.00r.
Baichtal, James R.; and McDonald, John C., to Vidar Corporation. Message metering and storage system. 3,825,689, Cl. 179-7.00r.
Bailey, Bill G.: *See—*
Behrle, Clyde J., 3,825,284.
Ballantyne, David B., to General Motors Corporation. Method of making extruded panel and nut assembly. 3,824,675, Cl. 29-445.000.
Bang and Olufsen A/S: *See—*
Mikkelsen, Eric, 3,825,209.
Banner, Philip M. Tide and time calculating device. 3,825,181, Cl. 235-88.000.
Bannister, Patricia A. Method and equipment for sewing. 3,824,628, Cl. 2-243.00r.
Barba, Jose Gracia. System for regulating rotary speed of a shaft. 3,824,780, Cl. 58-23.00r.
Barber, Eugene J.: *See—*
Gustison, Robert A.; Bernhardt, Harvey A.; Barber, Eugene J.; and Benton, Samuel T., 3,825,650.
Barbera, Melvin A., to Procter & Gamble Company, The. Unsaturated zwitterionic surface active compounds. 3,825,588, Cl. 260-513.00r.
Barenyi, Bela, to Daimler-Benz Aktiengesellschaft. Arrangement of a roof in a motor vehicle. 3,825,297, Cl. 296-137.00r.
Barker Manufacturing Company: *See—*
Roemer, Bruce W., 3,825,310.
Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See—*
Schippers, Heinz; Lenk, Erich; and Busch, Hansjochen, 3,825,206.
Barnes Engineering Company: *See—*
Weiss, Morris, 3,825,756.
Barnett, Lois H. Method of forming multiple passageway plastic conduit. 3,825,641, Cl. 264-89.000.
Barrett, Harrison H.; and Horrigan, Frank A., to Raytheon Company. Nuclear imaging system. 3,825,757, Cl. 250-363.000.
Bartlett, Gary F.; and Zampetti, Patrick L., to Construction Specialties, Inc. Combination handrail and wall protector. 3,825,229, Cl. 256-59.000.
Basset, Jean-Claude; and Heins, Pierre, to U.S. Philips Corporation. Frequency synthesizer with coarse stairstep frequency control and fine phase control. 3,825,855, Cl. 331-1.00a.
Bastow, Donald. Fuel metering divice. 3,824,975, Cl. 123-139.00a.
Bates, Keith: *See—*
Franklin, Kenneth John; and Bates, Keith, 3,824,997.
Bathla, Pritam S., to United Aircraft Products, Inc. Leak protected heat exchanger. 3,825,061, Cl. 165-70.000.
Batka, Heimold: *See—*

Altenschopfer, Theodor; and Batka, Heimold, 3,825,498.
Batson, Dossie M. Multiple load storage and transfer apparatus. 3,825,131, Cl. 214-38.00c.
Battaglia, Dino; Bergonzi, Mario; Teagno, Wladimiro; and Trevisiol, Franco, to AMP Incorporated. Electrical connector housing. 3,825,880, Cl. 339-59.00r.
Bauch, Ernst, to Neumunstersche Maschinen- und Apparatebau Gesellschaft mbH. Apparatus for crimping of filamentary materials. 3,824,656, Cl. 28-1.300.
Bauchmann, Donald K. Control devices for dampers and the like. 3,825,182, Cl. 236-1.00c.
Bauer, Fritz, to Suspa Federungstechnik GmbH. Hydraulically lockable lifting device. 3,825,244, Cl. 267-124.000.
Baule, Gerhard M., to Instruments for Cardiac Research Inc. Method and apparatus for producing sample electrocardiograms. 3,824,990, Cl. 128-2.06g.
Baum, Jasper: *See—*
Jerry, Albert; and Baum, Jasper, 3,825,700.
Baumann, Frederick William; Kaczkowski, Bernard Ceasar; Rosenberry, George Mowry, Jr.; and Smith, William R., to General Electric Company. Horizontal centrifugal casting machine. 3,825,057, Cl. 164-292.000.
Baumann, Kurt, to Krups, Robert. Dry shaver. 3,824,687, Cl. 30-43.920.
Baxter Laboratories, Inc.: *See—*
Huggins, James A., 3,825,000.
Bayer Aktiengesellschaft: *See—*
Eifler, Willi; and Finkel, Josef, 3,825,598.
Eipeltauer, Eduard; Lauss, Hans-Dietrich; and Spreckelmeyer, Bernhard, 3,825,655.
Hofer, Wolfgang; Schliebs, Reinhard; Schmidt, Robert; and Eue, Ludwig, 3,825,635.
Hoffmann, Hellmut; Behrenz, Wolfgang; and Hammann, Ingeborg, 3,825,557.
Kishino, Shigeo; Kudamatsu, Akio; Takase, Iwao; Shiokawa, Kozo; and Yamaguchi, Shini-Ichi, 3,825,636.
Bayless, Jack H.: *See—*
Lloyd, James R.; Williams, Robert E.; Bayless, Jack H.; Ortloff, Gerald D.; and Bruce, George H., 3,825,065.
BBC Brown Boveri & Company Limited: *See—*
Amelunxen, Bernd, 3,825,804.
Bear Brand Hosiery Co.: *See—*
Lewis, George E., 3,824,763.
Beavitt, Alan Robert; and McCarthy, John Peter, to Plessey Handel und Investments A.G. Electrical integrated circuit package. 3,825,801, Cl. 317-101.0cp.
Beck, Don D. Pipe handling apparatus. 3,825,129, Cl. 214-2.500.
Beck, Mark E.: *See—*
Grabb, Frederick G.; and Beck, Mark E., 3,824,792.
Becker, Denis 'ohn: *See—*
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Beecham Group Limited: *See—*
Mullan, Noel Austin; and Overell, Brian George, 3,825,525.
Beehive Machinery Inc.: *See—*
McFarland, Archie Rae, 3,825,231.
Beery, Jack; and De Carteret, Gerald A., to Burroughs Corporation. System for controlling the feed of documents into and along a document transport path. 3,825,251, Cl. 271-258.000.
Behrenz, Wolfgang: *See—*
Hoffmann, Hellmut; Behrenz, Wolfgang; and Hammann, Ingeborg, 3,825,557.
Behrle, Clyde J., 1/2 interest to Bailey, Bill G. Safety hitch pin. 3,825,284, Cl. 280-515.000.
Bell & Howell Company: *See—*
Burch, Nathan L.; and Tapia, Leonard G. (said Tapia assor. to), 3,824,685.
La Rue, Mervin W., Jr., 3,825,207.
Bell, Henry P.; and Licata, William H., to United States of America, Navy. Solid state resolver. 3,825,840, Cl. 327-27.000.
Bell, Oliver A., Jr., to Colt Industries Operating Corporation. Function control circuit for EDM power supply. 3,825,713, Cl. 219-69.00g.
Bell Telephone Laboratories, Incorporated: *See—*
Boll, Harry Joseph, 3,825,771.
Cook, John Stone; and Marcatili, Enrique Alfredo Jose, 3,825,319.
Felsberg, Robert Irving; and Micdema, Hotze, 3,825,843.
Martin, Frank Herbert, 3,825,355.
Bell Telephone Labortories, Incorporated: *See—*
Montgomery, William Lloyd, 3,825,924.
Bellastio, Aldo, to Industrie Pirelli Societa per Azioni. Fluid sealing device for electric cable curing apparatus. 3,825,271, Cl. 277-34.300.
Beller, Herbert R.; and Onufer, George R., said Onufer assor. to Russell, Burdsall & Ward, Inc. Method of and apparatus for burning internal combustion engine exhaust gases. 3,824,791, Cl. 60-303.000.
Bello, Vincent G., to United Aircraft Corporation. CRT geometry correction network. 3,825,796, Cl. 315-276.00d.
Bello, Wolfert; van der Muelen, Wijbren; and Halma, Pieter, to U.S. Philips Corporation. Pressing control device. 3,825,386, Cl. 425-150.000.
Bellows Alfred H.: *See—*
Metcalf, Arthur G. B.; Guiffrida, Philip; and Bellows Alfred H., 3,825,913.
Belohoubek, Erwin Franz; and Stevenson, David Michael, to RCA Corporation. Transistor carrier for microwave stripline circuit. 3,825,805, Cl. 317-234.00r.
Bemis, Alan G.; Darin, John K.; and Hoff, Melvern C., to Standard Oil Company. Recovery of meta-xylene by selective crystallization. 3,825,614, Cl. 260-674.00a.
Bendix Corporation, The: *See—*
Carp, Ralph W.; Ingels, Ward A.; and Ang, Leoncio T., 3,825,307.
Grabb, Frederick G.; and Beck, Mark E., 3,824,792.
Hemmer, Valentine J., 3,825,883.
Kasselmann, John T.; Hickner, George B.; Howard, Donald W.; and Needham, James M., 3,825,305.
Kasselmann, John T.; and Goran, Michael B., 3,825,308.
Tumbush, Gerald, 3,825,827.
Benjamin, Herschel A., to Carrier Corporation. Diaphragm structure for a multi-stage centrifugal gas compressor. 3,825,368, Cl. 415-199.00a.
Bennet, Stanford M.; Smith, William; and Thomas, Joseph J., to Johnson & Johnson. Catheter placement unit. 3,825,001, Cl. 128-214.400.
Bennet, Tom Joachim; Nordstroem, Knut Lennart; and Polhaell, Karl Olof, to Morgardshommar Aktiebolag. Two-high rolling stand. 3,824,830, Cl. 72-249.000.
Bennett, Frank L.: *See—*
Black, Thomas J.; and Bennett, Frank L., 3,825,115.
Benton, Samuel T.: *See—*
Gustison, Robert A.; Bernhardt, Harvey A.; Barber, Eugene J.; and Benton, Samuel T., 3,825,650.
Berchenbriter, Gerald D.: *See—*
Whitehill, Rex G.; Berchenbriter, Gerald D.; and Jensen, Winton D., 3,825,227.
Berens, Alan R.; and Paxton, Thomas R., to Goodrich, B. F., Company, The. Internally coated reaction vessel and process for coating the same. 3,825,434, Cl. 117-72.000.
Bergdahl, Sven Gunnar: *See—*
Janelid, Ingvar; and Bergdahl, Sven Gunnar, 3,824,911.
Bergeron, Joseph S. Trailer awning strap. 3,825,023, Cl. 135-5.0at.
Bergman, Kurt Tage Lennart, to Kafak Aktiebolag. Method and means for breaking a high-power circuit. 3,825,708, Cl. 200-146.00r.
Bergmann, Ewald; Schneider, Franz; Brandstetter, Rudi; and Kellenbenz, Rolf, to Schuler, L., GmbH. Overload safety device for the drive elements of presses. 3,824,821, Cl. 72-20.000.
Bergonzi, Mario: *See—*
Battaglia, Dino; Bergonzi, Mario; Teagno, Wladimiro; and Trevisiol, Franco, 3,825,880.
Berka, Paul H.: *See—*
Smith, Herman W.; and Berka, Paul H., 3,825,811.
Berkestad, Karl Erik: *See—*
Bryntse, Anders Ivar; and Berkestad, Karl Erik, 3,824,897.
Berkovits, Barough V., to American Optical Corporation. Single catherter for atrial and ventricular stimulation. 3,825,015, Cl. 128-404.000.
Bernhardt, Harvey A.: *See—*
Gustison, Robert A.; Bernhardt, Harvey A.; Barber, Eugene J.; and Benton, Samuel T., 3,825,650.
Bernin, Victor M.: *See—*
Engstrom, Keith A.; Bernin, Victor M.; and Bury, George J., 3,825,909.
Berthier, Georges, 1/2 to Emerjy. Switch for multispeed electric motor. 3,825,703, Cl. 200-46.000.
Betts, Max William; and Robinson, Frank, to Courtaulds Limited. Knitting method. 3,824,810, Cl. 66-76.000.
Bhopale, Arvind M.: *See—*
Stuart, Richard; and Bhopale, Arvind M., 3,825,834.
Biessener, Richard M., to Nutting Truck and Caster Company. Tow line truck and brake system. 3,824,930, Cl. 104-172.0bt.
Billings, Charles A.: *See—*
O'Neill, Gerald J.; Simons, Charles W.; and Billings, Charles A., 3,825,606.
Billows, Leonard Kay; and Gosling, Raymond John, to Protocol Engineering Limited. Preparation of lithographic plates. 3,824,828, Cl. 72-181.000.
Birch, Norman John, to National-Standard Company Limited. Method of and apparatus for stranding elongate material. 3,824,775, Cl. 57-58.520.
Birchfield, Jerry Linward; and Moss, Richard Wallace. Pulse rate discriminator generating output only at predetermined input frequency. 3,825,842, Cl. 328-138.000.
Bissell, James D. Electronic game or educational device. 3,825,266, Cl. 273-130.0ab.
Bittner, Charles W.; and Rexon, George F. Apparatus for manufacturing a fluid dispensing nipple construction. 3,825,393, Cl. 425-392.000.
Black and Decker Manufacturing Company, The: *See—*
Wheeler, Dale Kenneth, 3,824,684.
Black, James R.; and Mattox, Robert J., to Motorola, Inc. Method of preventing a chemical reaction between aluminum and silicon dioxide in a semiconductor device. 3,825,453, Cl. 156-3.000.
Black, Thomas J.; and Bennett, Frank L., to Universal Machine Company, Inc. Coin roll pick-up conveyor. 3,825,115, Cl. 209-73.000.
Blair, Samuel Darrell, to International Business Machines Corporation. Adhesively eradicable transfer medium. 3,825,437, Cl. 117-36.100.
Blake, Jack W., to Jacobs, F. L., Co. Ash receptacle for automobiles. 3,825,314, Cl. 312-245.000.

Blaschke, Felix; and Schleicher, Lothar, to Siemens Aktiengesellschaft. Apparatus for generating two amplitude-stabilized voltages. 3,825,738, Cl. 235-197.000.

Blewitt, Donald D., to Westinghouse Electric Corporation. Electric fuse with trip device. 3,825,871, Cl. 337-171.000.

Bloching, Helmut: *See*—
Kuhling, Dieter; and Bloching, Helmut, 3,825,543.

Bloomquist, George W., to FMC Corporation. Fluid delivery and vapor recovery apparatus. 3,825,045, Cl. 141-198.000.

Blue Bell Inc., mesne: *See*—
Miller, Roy E., 3,825,250.

Boardman Company, The: *See*—
Frye, James A.; and Morton, Ralph B., 3,825,230.

Bock, Nils Erik, to Morgardshammar Aktiebolag. Guide roller in roller guides. 3,824,831, Cl. 72-251.000.

Bodas, Janos: *See*—
Heller, Laszlo; Forgo, Laszlo; and Bodas, Janos, 3,825,062.

Bodem, Roy C.: *See*—
Unterborn, Ralph D.; Bodem, Roy C.; and Wanner, Joseph W., 3,825,243.

Boeing Company, The: *See*—
Darges, Walter; Karpis, John J.; Petitgout, George L.; and Witbeck, Walter G., 3,825,212.
Hensen, Karl A.; and Lunden, Clarence D., 3,825,819.

Bogar, Earl M., Jr. Adjustable bed frame. 3,824,638, Cl. 5-181.000.

Bogatin, Irvin: *See*—
Marus, Louis J.; and Abernathy, James D., 3,825,921.

Bogue, John C.: *See*—
Bogue, John C.; and Sarbacher, Robert I (said Sarbacher assor. to said), 3,825,833.

Bogue, John C.; and Sarbacher, Robert I, said Sarbacher assor. to said Bogue, John C. Personal security device. 3,825,833, Cl. 325-119.000.

Boise Cascade Corporation: *See*—
Achermann, Werner; and Achermann, Franz, 3,825,441.

Boll, Harry Joseph, to Bell Telephone Laboratories, Incorporated. Igfet inverter circuit. 3,825,771, Cl. 307-214.000.

Bombardier, Jerome, to Bombardier Limited. Stop device for snowmobile steering mechanism. 3,825,086, Cl. 180-5.00r.

Bombardier Limited: *See*—
Bombardier, Jerome, 3,825,086.

Bondie, Dale J.; Sutton, Robert S.; and Lewelling, James D., to Ex-Cell-O Corporation. Machine tool with automatic tool changing means. 3,824,892, Cl. 90-58.00b.

Bonne, Roger, to Commissariat a l'Energie Atomique. Device for analysing a substance by atomic absorption with background correction. 3,825,344, Cl. 356-85.000.

Boone, Philip. Supplemental sheet-dispensing device for a toilet-tissue dispenser. 3,824,953, Cl. 118-75.000.

Boone, Robert L. Fishing lure. 3,824,732, Cl. 43-42.050.

Booth, Clarence R., Jr., to Continental Can Company, Inc. Compartmentalized carton. 3,825,174, Cl. 229-28.00b.

Borg-Warner Corporation: *See*—
Allaben, Charles M., Jr., 3,825,312.

Borglum, Keith B. Cover assembly. 3,825,215, Cl. 248-147.000.

Bosch, Robert, G.m.b.H.: *See*—
Herrmann, Walter, 3,825,028.
Schneider, Rolf; and Muller, Hans-Martin, 3,824,966.
Wirtz, Rainer, 3,825,813.

Bosch, Robert, Photokino GmbH: *See*—
Heinrich, Frank-Armin; and Kiefer, Hans-Friedrich, 3,825,329.
Krumbein, Fritz; and Lieckfeldt, Hans, 3,825,218.

Bosley, Denis V.: *See*—
Pitkanen, Alan R.; Kennedy, Melvin R.; Nagel, Dietmar; Gross, William J.; and Bosley, Denis V., 3,825,265.

Bossen, Douglas C.; Hong, Se J.; Hsiao, Mu-Yue; and Patel, Arvind M., to International Business Machines Corporation. Modular distributed error detection and correction apparatus and method. 3,825,893, Cl. 340-146.1al.

Boston Machine Works Co.: *See*—
DeCoulos, John, 3,824,643.

Bottoms, Harry Simister, to Lucas, Joseph, (Industries) Limited. Gear pumps and motors. 3,825,377, Cl. 418-170.000.

Bottos, Baltassar. Insect trap. 3,824,734, Cl. 43-121.000.

Bouffard, Joseph T.: *See*—
McManus, Walter K.; Bouffard, Joseph T.; and Harris, Lennard D., 3,825,047.

Bouiller, Jean Georges: *See*—
Soligny, Marcel Robert; and Bouiller, Jean Georges, 3,824,785.

Boultinghouse, Ace: *See*—
Procop, Alex J.; and Boultinghouse, Ace, 3,825,331.

Bourassa, Hugh A.: *See*—
Sorenson, Charles E.; Stubblefield, Clyde D.; Debaillie, Arnold A.; Bramley, Robert K.; and Bourassa, Hugh A., 3,824,772.

Bourton, Hubert. Device for deactivating automobile door operable electric switch. 3,825,705, Cl. 200-61.790.

Bowers, Gary L.; Lay, Clark M.; and Stephans, Albert E., to United States of America, Atomic Energy Commission. Command pulse generator for computer-controlled machining. 3,825,735, Cl. 235-151.110.

Bowman, John L., to Motorola, Inc. Machine for cutting brittle materials. 3,824,982, Cl. 125-16.000.

Boyak, Arnold C.: *See*—
Gardner, Guy F.; and Boyak, Arnold C., 3,825,073.

Boyd, Violet; Evans, Ronald Arthur; Holt, Kenneth Anthony; and Renfrew, Andrew Hunter Morris, to Imperial Chemical Industries Limited. Leucauramine derivatives. 3,825,507, Cl. 260-518.00r.

Bracco Industria Chemica Societa per Azioni: *See*—
Felder, Ernst; and Pitre, Davide, 3,825,591.

Bradford, Robert S.; Richardson, Harvey J.; Dubbe, Richard F.; and Ebbinga, Richard D., to Minnesota Mining & Manufacturing Company. System for controlling film motion. 3,825,675, Cl. 178-6.70a.

Braid, Milton, to Mobil Oil Corporation. Organic compositions containing synergistic antioxidant mixtures. 3,825,496, Cl. 252-48.200.

Bramley, Robert K.: *See*—
Sorenson, Charles E.; Stubblefield, Clyde D.; Debaillie, Arnold A.; Bramley, Robert K.; and Bourassa, Hugh A., 3,824,772.

Brandstatter, Georg: *See*—
Brandstatter, Horst, 3,824,735.

Brandstatter, Horst, to Brandstatter, Georg. Toy boat with separate compartment for battery and motor. 3,824,735, Cl. 46-243.0mv.

Brandstetter, Rudi: *See*—
Bergmann, Ewald; Schneider, Franz; Brandstetter, Rudi; and Kellenbenz, Rolf, 3,824,821.

Branick, Charles Earl. Wheel balancing apparatus. 3,824,862, Cl. 73-480.000.

Branovich, Louis E.; Fitzpatrick, William B. P.; and Long, Martin L, Jr., to United States of America, Army. Vapor deposition method. 3,825,440, Cl. 117-106.00r.

Brauer, Gualtiero, to Facem Fabbrica Apparecchi Controllo e Misura di Gualtiero Brauer. Microswitch device actuatable at two preset values of a measurable variable. 3,825,704, Cl. 200-56.00r.

Braun, Roland J., to International Business Machines Corporation. Hall cell with offset voltage control. 3,825,777, Cl. 307-309.000.

Braun, William V., to Motorola, Inc. Radio system employing simultaneously triggered pulse repeaters. 3,825,829, Cl. 325-6.000.

Breauer, Hermann: *See*—
Dolfini, Joseph Edward; and Breauer, Hermann, 3,825,529.

Breev, Boris DmitrievICH: *See*—
Smirnov, Mikhail Dmitrievich; Ershov, Boris Alexandrovich; Savitsky, Vladilen Nikolaevich; Breev, Boris DmitrievICH; Atkarsky, Anatoly Alexandrovich; Shardakov, Svyatoslav Viktorovich; Sinajuk, David Aronovich; Stukalov, Vladimir Nikolaevich; and Puzynya, eonid Vasilievich, 3,824,642.

Bressanelli, Jerome P.: *See*—
Costello, Thomas M.; and Bressanelli, Jerome P., 3,825,417.

Brewington, Harold G. Remotely controlled mirror and power amplified drive means therefor. 3,825,324, Cl. 350-289.000.

Bridgestone Tire Company Limited: *See*—
Matsuyama, Takashi; Tanaka, Tetsuji; and Tezuka, Toshiro, 3,825,052.
Nakamura, Kihei; Yamazaki, Harumichi; Masuda, Hirotsugu; Sato, Takeshi; and Kiuchi, Yoshinori, 3,825,292.

Briggs & Stratton Corporation: *See*—
Tharman, Paul A., 3,824,682.

Briggs, Walton Ellis, to Varian Associates. Leak detecting system and method for passing a measured sample of gas to a leak detector. 3,824,839, Cl. 73-40.700.

Briskman, Robert David, to Communications Satellite Corporation. Television radio frequency switch. 3,825,837, Cl. 325-456.000.

Bristol Products, Inc.: *See*—
Brown, Glenn R., 3,824,636.

Bristol-Myers Company: *See*—
Vogan, John Edward; and Granatek, Edmund Stanley, 3,825,528.

British Titan Limited: *See*—
Hinley, John James; and Gibson, John, 3,825,388.
Pritchard, David William; and Wiseman, Thomas James, 3,825,438.

British-American Tobacco Co., Ltd.: *See*—
Hart, Joel C.; and Traughber, Charles W., Jr., 3,824,758.

Bronkhorst, Armand Francois, to Holvricka International B.V. Processing a curd-whey mixture. 3,824,918, Cl. 99-452.000.

Bronswerk-Apparatenbouw N.V., v/h Moring & Steenaart: *See*—
Van Diepenbroek, Alfred Erich Wibrandt, 3,824,768.

Brooks, Daryl G. Self-tapping replacement stud with chip collection and storage chamber. 3,824,888, Cl. 85-47.000.

Brooks, John Hawley, to MuCulloch Corporation. Multi-stage control for torque converters in engine driven vehicles. 3,824,867, Cl. 74-230.17e.

Brothers, Donald C.: *See*—
Elia, Frederick J.; Brothers, Donald C.; Hofschild, Clewell; and Bryson, Robert A., 3,825,246.

Brown & Root, Inc.: *See*—
Kolb, Alfred Reeves, 3,825,076.

Brown, Clinton E.; and Frommer, Moshe-Aharon, to Hydronautics, Incorporated. Peritoneal artificial kidney. 3,825,493, Cl. 210-23.000.

Brown, Glenn R., to Bristol Products, Inc. Wash basin adapted for securement to a support. 3,824,636, Cl. 44-187.00a.

Brown, Henry: *See*—
Clauss, Richard J.; Tomaszewski, Thaddeus W.; and Brown, Henry, 3,825,478.

Brown, Neil F.: *See*—
Krier, Keith N.; Brown, Neil F.; and Waldhauser, Steven J.A., 3,824,645.

Brown, Omar L.; and Schubert, James R., to Fraze, Ermal C. Easy opening container having shoulders to safeguard all severed edges. 3,825,149, Cl. 220-54.000.

Brown, Richard E., to Warner-Lambert Company. Process for preparing substituted chromone-3-carbonitriles, carboxamides and carboxylic acids. 3,825,574, Cl. 260-345.200.

Brown, Wendell W.; Davis, Michael I.; and Pipitone, Ralph M., to International Business Machines Corporation. Interlevel communication in multilevel priority interrupt system. 3,825,902, Cl. 340-172.500.

Brown, Wendell W., to International Business Machines Corporation. Automatic switching of storage protect keys. 3,825,903, Cl. 340-172.500.

Brownback, Dewey Earl, to International Business Machines Corporation. Interfacing circuitry for connecting a remote keyboard with a data receiving buffer. 3,825,926, Cl. 340-365.00c.

Brubaker, Harry E. Automatic rake. 3,824,773, Cl. 56-369.000.

Bruce, George H.: *See—*
Lloyd, James R.; Williams, Robert E.; Bayless, Jack H.; Ortloff, Gerald D.; and Bruce, George H., 3,825,065.

Brucker, William S. Golf-club selection aid. 3,824,698, Cl. 33-277.000.

Brumagim, Ivan S., to Secondary Processing Systems, Inc. Rotary internal combustion engine. 3,824,968, Cl. 123-8.450.

Brunswick Corporation: *See—*
Gautraud, Michael G.; Gretzky, Anthony J.; Zachev, Ivan; Dunn, Richard D.; and Szymanski, Richard, 3,825,749.

Bryntse, Anders Ivar; and Berkestad, Karl Erik, to AB Bygg-och Transportekoneone (BF). Multispeed hydraulic or pneumatic device. 3,824,897, Cl. 91-411.00a.

Bryson, Robert A.: *See—*
Elia, Frederick J.; Brothers, Donald C.; Hofschild, Clewell; and Bryson, Robert A., 3,825,246.

Bublitz, Donald E.: *See—*
Kurihara, Norman H.; and Bublitz, Donald E., 3,825,548.

Buchanan, Robert A.; Alves, Ronald V.; Maple, T. Grant; and Sobon, Leon E., to Lockheed Missiles & Space Company, Inc. Method of making rare earth oxysulfide luminescent film. 3,825,436, Cl. 117-33.50r.

Budde, Herman, to U.S. Philips Corporation. Semiconductor lead and heat sink structure. 3,825,803, Cl. 317-234.00r.

Buell, Kenneth B., to Procter & Gamble Company, The. Apparatus for preparing airfelt. 3,824,652, Cl. 19-156.300.

Buell, Kenneth B., to Procter & Gamble Company, The. Apparatus for preparing airfelt. 3,825,194, Cl. 241-191.000.

Bulin, Edward G., to Webster Electric Company, Inc. Method of encapsulating electric equipment. 3,825,639, Cl. 264-72.000.

Bull, Brian S., to Coulter Electronics, Inc. Method for sedimentation study. 3,824,841, Cl. 73-61.400.

Bull, Willard E.: *See—*
Johnson, Lewis T.; and Bull, Willard E., 3,825,114.

Buntin, Robert R.: *See—*
Harding, John W.; Keller, James P.; and Buntin, Robert R., 3,825,380.

Burch, Nathan L.; and Tapia, Leonard G., said Tapia assor. to Bell & Howell Company. Method of making a ferrite head. 3,824,685, Cl. 29-603.000.

Burchett, Paul James. Tethered ball for sports practice. 3,825,259, Cl. 273-29.00a.

Burdick, Robert E.; and Wolf, Baxter K., to Rolair Systems, Inc. Modular air cushion transporting system. 3,825,093, Cl. 180-119.000.

Burdick, Robert E., to Rolair Systems, Inc. Remote control for air bearing transporters and the like. 3,825,094, Cl. 180-125.000.

Burg, Donald E., to American Hospital Supply Corporation. Centrifuge rotor. 3,825,178, Cl. 233-26.000.

Burk, Emmett H.; and Fuger, Karl E., to Atlantic Richfield Company. Method for preparing cyclic nitrile carbonates. 3,825,554, Cl. 260-307.00a.

Burk, John L.; Duffy, Daniel M.; Hogan, Spurgeon G., Jr.; Larson, Russell H.; and McGilvray, Bruce L., to International Business Machines Corporation. Virtual memory system. 3,825,904, Cl. 340-172.500.

Burlington Industries, Inc.: *See—*
Flanders, Harry E., Jr., 3,824,778.
London, Joe F., Jr., 3,824,776.

Burndy Corporation: *See—*
Wigby, Jon, 3,825,881.

Burns, Gerald Edward: *See—*
Stafford, Donald Claude; Burns, Gerald Edward; and McKenna, Kerry Charles, 3,824,942.

Burns, Harold S., to Electro Marine Corporation. Remote reading compass system. 3,825,911, Cl. 340-198.000.

Burns, Robert G., to Pylon, Incorporated. Outdoor display device for sequentially displaying a series of panels. 3,824,721, Cl. 40-32.000.

Burroughs Corporation: *See—*
Beery, Jack; and De Carteret, Gerald A., 3,825,251.
Kjos, Magne Jarle; and Molleman, Johan Henri, 3,825,203.

Burstein, Albert H.; and Heiple, Kingsbury G., to Sampson Corporation, The. Bone joint fusion prosthesis. 3,824,631, Cl. 3-1.000.

Burthardt, Charles J. Adjustable screw-lock pliers. 3,824,882, Cl. 81-401.000.

Bury, George J.: *See—*
Engstrom, Keith A.; Bernin, Victor M.; and Bury, George J., 3,825,909.

Busch, Hansjochen: *See—*
Schippers, Heinz; Lenk, Erich; and Busch, Hansjochen, 3,825,206.

Butterweck, Hellmut. Sealed-end jacked pipe assembly and method of making same. 3,825,035, Cl. 138-109.000.

Butwell, Robert J., to Varian Associates. Microwave tube having an improved output section. 3,825,794, Cl. 315-3.600.

BYK Gulden Lomberg Chemische Fabrik GmbH: *See—*
Klemm, Kurt; and Langenscheid, Erhard, 3,825,589.

Cahoy, Roger P.: *See—*
Sanjean, John; and Cahoy, Roger P., 3,825,663.

Cahoy, Roger Paul, to Gulf Research & Development Company. Method for combating certain foliar diseases of plants. 3,825,662, Cl. 424-300.000.

California Crime Technological Research Foundation: *See—*
Steele, Richard K.; and Roudabush, Douglas E., 3,825,916.

California Pellet Mill Company: *See—*
Gilman, Robert W., 3,825,387.

Call, Donald H.; Atwood, Elbridge L.; Cary, Joseph A.; and Surette, James D. Mini sewage treatment system. 3,825,494, Cl. 210-138.000.

Camber International (England) Limited: *See—*
Canderton, Norman Victor; and Goadby, Walter, 3,824,809.

Campagna, Edward R., to Dart Industries, Inc. Covered glass bottle or the like. 3,825,141, Cl. 215-1.00c.

Campagna, Edward R., to Dart Industries, Inc. Thermoplastic shielded glass bottle. 3,825,142, Cl. 215-1.00c.

Campbell, Alastair; and Thoburn, Allan, to Imperial Chemical Industries Limited. Manufacture of 1, 1,1-trichloroethane. 3,825,609, Cl. 260-658.00j.

Campbell, J. A., Company: *See—*
Williams, Rodney A., 3,824,765.

Campbell, Robert E.; Hetzler, Lewis R.; and Huntzinger, Gerald O., to General Motors Corporation. Internal combustion engine ignition system. 3,824,977, Cl. 123-148.00e.

Campbell, William G., Jr.: *See—*
Yablonski, Robert E.; Hager, George S.; and Campbell, William G., Jr., 3,824,870.

Canderton, Norman Victor; and Goadby, Walter, to Camber International (England) Limited. Patterning mechanism for multi-feed circular knitting machines. 3,824,809, Cl. 66-50.00r.

Canoga Controls Corporation: *See—*
Koerner, Ralph J., 3,825,889.

Canon Camera Kabushiki Kaisha: *See—*
Inoue, Eiichi; Shimizu, Isamu; Kobayashi, Hajime; and Endo, Ichiro, 3,825,427.

Canon Kabushiki Kaisha: *See—*
Inoue, Eiichi; Tsujiuchi, Junpei; Kokado, Hiroshi; Yamaguchi, Takashi; Shimizu, Isamu; Sakuma, Hiraku; Hanada, Hiroshi; and Tokunaga, Yukio, 3,825,317.
Moriyama, Inao; and Toyama, Masamichi, 3,825,941.
Suzaki, Kuniyoshi, 3,825,330.
Watanabe, Hiroaki; and Nakamoto, Soichi, 3,825,942.

Canron, Inc.: *See—*
Richardson, Rolland A., 3,824,822.

Capucio, Eugene G. Drop-out toaster. 3,824,915, Cl. 99-329.0rt.

Carborundum Company, The: *See—*
Economy, James; and Matkovich, Vlado I., 3,825,469.

Carlick, Daniel J.; Marra, Frank; and Sprenger, Gerhard E., to Sun Chemical Corporation. Radiation curable printing ink compositions comprising an isocyanate-modified polyfunctional ester and a photoinititator. 3,825,479, Cl. 204-159.230.

Carlisle, Richard S. Highly absorbent pressure dressing for wounds. 3,824,996, Cl. 128-165.000.

Carlsson, Hilding Ake Gerry: *See—*
Johansson, Sture Ragnar; and Carlsson, Hilding Ake Gerry, 3,825,397.

Carp, Ralph W.; Ingels, Ward A.; and Ang, Leoncio T., to Bendix Corporation, The. Means for detecting failure of various elements of an adaptive braking system through the use of trickle currents. 3,825,307, Cl. 303-21.0af.

Carpenter, Denis Cecil John: *See—*
Mackrill, David; Carpenter, Denis Cecil John; and Howard, Michael John, 3,825,137.

Carr, George W., to Pullman Incorporated. Twist lock arrangement for tying container down. 3,825,294, Cl. 296-35.00a.

Carr, Paul H., to United States of America, Air Force. Suface wave delay line with quarter-wave taps. 3,825,860, Cl. 333-30.00r.

Carr, Walter J., Jr.; and Miller, Robert C., to Westinghouse Electric Corporation. Propagation of magnetic domains by self-induced drive fields 6340/174.0tf. 3,825,910, Cl. .

Carrier Corporation: *See—*
Benjamin, Herschel A., 3,825,368.
Church, Richard A., 3,824,800.
Smith, Joseph W.; and Hollencamp, Eugene A., 3,824,667.

Carroll, John E.; and Stump, Carl E., to Lincoln Electric Company, The. Electrode for vertical-up open arc welding using molding shoes. 3,825,721, Cl. 219-146.000.

Carroll, Richard R., to Litton Industrial Products, Inc. Machine tool. 3,824,891, Cl. 90-11.00a.

Carter, Edward W., to Glasrock Products, Inc. Method of preparation of a porous thermosetting resin. 3,825,506, Cl. 260-2.50l.

Cary, John M.; and Mahacek, Michael F. Exendible conveyor system. 3,825,107, Cl. 198-139.000.

Cary, Joseph A.: *See—*
Call, Donald H.; Atwood, Elbridge L.; Cary, Joseph A.; and Surette, James D., 3,825,494.

Casciano, Frederick M. Steerable aqua-sled. 3,824,945, Cl. 114-235.0ws.

Casiano, Sergio M. Expresso coffee machine. 3,824,914, Cl. 99-302.00r.

Castonguay, Roger A.: *See—*
Menashi, Wilson P.; Wenckus, Joseph F.; and Castonguay, Roger A., 3,825,242.

Castrol Limited: *See—*
Ker, Robert Alan Cameron, 3,825,497.

Catchpole, Richard John, to International Standard Electric Corporation. Error detector for low disparity code signals. 3,825,892, Cl. 340-146.lab.

Caterpillar Tractor Co.: *See—*
Erickson, Rodney R.; Hopkins, Donald L.; and Norick, William B., 3,825,287.
Fulton, Clyde E., 3,825,359.
Krolak, Ronald L.; and Oestmann, Eldon D., 3,825,309.

Caterpillar Tractor Company: *See—*
Copeland, Kermit L., 3,825,088.
Geselbracht, Thomas H.; and Vinton, David S., 3,825,091.
Myers, Jimmy D., 3,825,280.
Stedman, Robert N.; and Purcell, Robert J., 3,825,074.

C.A.V. Limited: *See—*
Reval, Hardev, 3,825,817.

Cederberg, Howard R.; and Wiedeman, Charles W., to Singer Company, The. Data terminal with dual three-station printing. 3,825,681, Cl. 178-23.00r.

Celanese Corporation: *See—*
Snyder, George W., 3,824,998.

Central Texas Iron Works, Inc.: *See—*
Williams, John K., 3,824,771.

Certain-Teed Products Corporation: *See—*
Heilmayr, Peter F.; and Kimbrell, Sol B., 3,825,390.

Ceskoslovenska akademie ved: *See—*
Wichterle, Otto; and Kliment, Karel, 3,825,458.

CGT Corp.: *See—*
Horneff, James P.; and Pelosi, Michael H., Jr., 3,824,909.

Chambers, Charles W., Jr., to Lorain Products Corporation. Test-through circuit for telephone system voltage boosters. 3,825,698, Cl. 179-16.00f.

Chambers, Marshall R. Automotive brake tester assembly. 3,824,847, Cl. 73-132.000.

Chapman, Charles C., to Phillips Petroleum Company. Treating alkylate-containing hydrocarbon with HF in a unitary vessel. 3,825,616, Cl. 260-683.480.

Chappelow, Cecil C., Jr.; and Engel, James F., to Kerr-McGee Corporation. N-Cycloalkyl hydroxamic acids. 3,825,585, Cl. 260-500.50h.

Charvet, Joseph. Method and apparatus for forming flexible corrugated members. 3,824,826, Cl. 72-77.000.

Chemetron Corporation: *See—*
Marshall, Robert Howard; and Wallace, Gary Leonard, 3,824,885.

Chemiebau Dr. A. Zieren G.m.b.H., & Co., K.G.: *See—*
Jenniges, Ernst, 3,825,657.

Cherry, Kenneth Floyd. Navigational devices. 3,824,693, Cl. 33-76.00r.

Chevallier, Pierre, to Etablissements Genoud & Cie Societe Anonyme. Automatic cigarette lighter mechanism. 3,825,401, Cl. 431-274.000.

Chevron Research Company: *See—*
Magee, Philip S., 3,825,634.

Chicago Bridge & Iron Company: *See—*
Stafford, Donald Claude; Burns, Gerald Edward; and McKenna, Kerry Charles, 3,824,942.

Childress, Bobby B.: *See—*
Litner, Frank W.; and Childress, Bobby B., 3,825,725.

Chipman, Julian C.C. Combination carry case and seat. 3,825,298, Cl. 297-129.000.

Chisholm-Ryder Company, Inc.: *See—*
Ferrraro, Dominic, 3,825,018.

Chouings, Leslie Cyril, to Automotive Products Company Limited. Accumulators. 3,825,034, Cl. 138-30.000.

Christensen, Burton G.; and Lianza, William J., to Merck & Co., Inc. Acetyl-butyl-cis-l-propenyl phosphonate. 3,825,631, Cl. 260-941.000.

Christensen Diamond Products Company: *See—*
Flarity, Frank O'Dell; and Eustace, Waymon Rhea, 3,825,083.

Chugai Seiyaku Kabushiki Kaisha: *See—*
Mori, Takasi; Takaku, Sakae; Suzuki, Seikichi; and Tsuda, Minoru, 3,825,571.

Church, Richard A., to Carrier Corporation. Air conditioning unit and control. 3,824,800, Cl. 62-186.000.

Ciba-Geigy AG: *See—*
Jaeger, Horst, 3,825,575.
Weber, Kurt; and Luethi, Christian, 3,825,534.

Ciba-Geigy Corporation: *See—*
Eckert, Robert John, Jr.; and Laran, Roy Joseph, 3,825,658.

Cimarusti, Christopher M.; Giarrusso, Frederick F.; and Levine, Seymour D., to Squibb, E. R., & Sons, Inc. A-nor-3-thia corticoids. 3,825,566, Cl. 260-332.30p.

Cinzori, Robert J.; and Stapleton, Gerald F., to Santa Barbara Research Center. Dual spectrum infrared fire detection system with high energy ammunition round discrimination. 3,825,754, Cl. 250-338.000.

Ciolfi, Quentin P. Flag holder. 3,825,214, Cl. 248-43.000.

Cities Service Oil Company: *See—*
Ford, Reginald G., 3,824,767.

Citizen Watch Co., Ltd.: *See—*
Iinuma, Yoshio, 3,824,782.

Clark, Albert L., to Pac-Craft Products, Inc. Aerial scaffold for vehicle. 3,825,095, Cl. 182-17.000.

Clark, Alex L., Limited: *See—*
Masygan, Raymond Joseph, 3,825,943.

Clark Equipment Company: *See—*
Visser, Peter J., 3,824,904.

Clark, Kenneth M., to Deutsch Company Electronic Components Division, The. Contact insertion and removal tool. 3,824,670, Cl. 29-203.00h.

Clark, Kenneth M., to Deutsch Company Electronic Components Division. Method of providing a coupling for electrical connectors or the like. 3,824,681, Cl. 29-593.000.

Clauss, Richard J.; Tomaszewski, Thaddeus W.; and Brown, Henry, to Oxy Metal Finishing Corporation. Electrolyte and method for electrodepositing microporous chromium-nickel composite coatings. 3,825,478, Cl. 204-41.000.

Clawson, Lawrence G., to Thermo Electron Corporation. Fuel system. 3,824,965, Cl. 123-32.00r.

Clemence, Francois: *See—*
Hagemann, Guy; and Clemence, Francois, 3,825,664.

Clements Michael R.: *See—*
Larsen, Dee E.; and Clements Michael R., 3,825,895.

Clinical Technology Incorporated: *See—*
Nicholson, James E.; and Lipson, Charles S., 3,824,992.

Clough, James: *See—*
Vaughan, William A., Jr; and Clough, James, 3,824,715.

Cloutier, Edward J.: *See—*
Saunders, Roger I.; and Cloutier, Edward J., 3,825,213.

Coats & Clark, Inc.: *See—*
Dobrjanskyj, Lew; and Einhorn, Ruediger, 3,824,816.

Cobb, Austell C. A.: *See—*
Pugh, K. O.; Ivey, Howard; and Cobb, Austell C. A., 3,824,927.

Coca-Cola Company, The: *See—*
Heenan, Richard H.; and Litsinger, George M., 3,825,186.

Cockreham, Harry: *See—*
Turner, Leslie C.; and Cockreham, Harry, 3,824,937.

Coffee-Mat Corporation: *See—*
Herman, David; and Friedman, Sidney J., 3,824,913.

Cohen, Paul J. Umbrella of manually collapsible construction. 3,825,024, Cl. 135-20.00r.

Colangelo, Michele. Towing and lifting apparatus. 3,825,132, Cl. 214-86.00a.

Cole, Edward N.; and Niepoth, George W., to General Motors Corporation. Internal combustion engine and method of operation for exhaust emmission control. 3,824,788, Cl. 60-274.000.

Colgate-Palmolive Company: *See—*
Freedman, Jules, 3,825,539.
Suh, John T.; and Schnettler, Richard A., 3,825,590.

Collins, Eldred L., to Allis-Chalmers Corporation. Electronic upper link sensing. 3,825,072, Cl. 172-7.000.

Colt Industries Operating Corp.: *See—*
Into, Henry A., 3,824,69[illegible].

Colt Industries Operating Corp. (Firearms Division): *See—*
Kennedy, Ralph C., 3,824,728.

Colt Industries Operating Corporation: *See—*
Bull, Oliver A., Jr., 3,825,713.

Coltron Industries, Inc.: *See—*
Litner, Frank W.; and Childress, Bobby B., 3,825,725.

Colvert, James H.: *See—*
Coons, William R., Jr.; Colvert, James H.; and Nelson, Gerald V., 3,825,485.

Combustion Engineering, Inc.: *See—*
Lichtenberger, Harold V.; and Ruoss, Christian W., 3,825,160.

Combustion Equipment Associates, Inc.: *See—*
Lyshkow, Norman A., 3,824,836.

Commissariat a l'Energie Atomique: *See—*
Bacal, Martha; and Reichelt, Walter, 3,825,790.
Bonne, Roger, 3,825,344.
Pezot, Jacques, 3,825,856.

Communications Satellite Corporation: *See—*
Briskman, Robert David, 3,825,837.

Communications Statellite Corporation: *See—*
Haeberle, Heinz H.; and Husted, John M., 3,825,899.

Compagnie General d'Electricite: *See—*
Debart, Hubert, 3,825,340.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Penicaud, Etienne, 3,825,694.

Compere-Whitney, Alicia L., to Imperatrix. Process and device for producing microorganismic matter. 3,825,475, Cl. 195-104.000.

Compur-Werk Gesellschaft mit beschrankter Haftung & Co.: *See—*
Ritze, Arno, 3,825,688.

Connor, John S.; and Pugh, Robert E., to Fike Metal Products Corporation. Electrical control apparatus. 3,825,766, Cl. 307-9.000.

Consolidated Video Systems, Inc.: *See—*
Hendershot, William B., III; Wald, David; and Whitlock, Larry K., 3,825,948.

Construction Specialties, Inc.: *See—*
Bartlett, Gary F.; and Zampetti, Patrick L., 3,825,229.

Continental Can Company, Inc.: *See—*
Booth, Clarence R., Jr., 3,825,174.
Rarey, Kenneth W.; and Kennedy, John B., Jr., 3,824,924.

Cook, John Stone; and Marcatili, Enrique Alfredo Jose, to Bell Telephone Laboratories Incorporated. Butt-joined optical fibers. 3,825,319, Cl. 350-96.0wg.

Coons, William R., Jr.; Colvert, James H.; and Nelson, Gerald V., to Texaco Inc. Hydrocracking effluent cooling prior to hydrodesulfurization. 3,825,485, Cl. 208-97.000.

Coop, Vernon W., to Sugden, Bazil H. Method of joining sheet metal, and sheet metal joints. 3,824,757, Cl. 52-758.00d.

Cooper, George W., to Fruehauf Corporation. Sway-arrest system. 3,825,128, Cl. 212-15.000.

Cooper, James E.: *See—*
Reiter, William M.; Cooper, James E.; and Sheth, Krishnakant K., 3,825,512.

Cooper, Patricia P. Proteus resistant agar culture media. 3,825,474, Cl. 195-103.50r.

Copeland, Kermit L., to Caterpillar Tractor Company. Equalizer bar mounting for track-type vehicles. 3,825,088, Cl. 180-9.500.

Cordell, Carl R., Jr. Open top compartmented lid. 3,824,733, Cl. 43-54.50r.

Cornell, Thomas V.; Smith, Wayne A.; and Wilkinson, Lester, to General Motors Corporation. Phase-lock-loop FM-stereo decoder including stereophonic/monophonic blend system for reducing audio distortion. 3,825,697, Cl. 179-15.0bt.

Corning Glass Works: *See—*
Tick, Paul A., 3,825,439.
Weber, William A.; and Wellech, Edmund H., 3,825,456.

Cornish, Steve D.: *See—*
United States of America, National Aeronautics and Space Administration, 3,825,760.

Cornog, Robert. Pipe coupling. 3,825,041, Cl. 141-1.000.

Cossar, Bernard Calvin: *See—*
Reynolds, Delbert Daniel; and Cossar, Bernard Calvin, 3,825,538.

Coste, Henri: *See—*
Fatosme, Albert; and Coste, Henri, 3,824,754.

Costello, Thomas M.; and Bressanelli, Jerome P., to Crucible Inc. Austenitic stainless steel. 3,825,417, Cl. 75-128.00a.

Coulter Electronics, Inc.: *See—*
Bull, Brian S., 3,824,841.

Courtaulds Limited: *See—*
Betts, Max William; and Robinson, Frank, 3,824,810.

Cowans, Kenneth W. Heat exchanger and method for making the same. 3,825,063, Cl. 165-146.000.

Crabb, Jasper R., to Domain Industries, Inc. Twist-tie bag closing machine. 3,825,039, Cl. 140-93.00a.

Craig, Daniel L.: *See—*
White, Dowell; and Craig, Daniel L., 3,825,733.

Crane, James W.; and Hand, David R., to Crosman Arms Company, Inc. Semi-automatic B-B pistol with trigger-connected linkages. 3,824,981, Cl. 124-11.00r.

Creators Limited: *See—*
Stent, Vernon Denis, 3,825,036.

Crested Butte Records, Inc.: *See—*
Schumaker, Aaron C.; and Hay, Isaac K., Jr., 3,825,112.

Cristiani, Athos, to AMF Incorporated. Decelerator of cigarettes collected by a fluted drum. 3,825,105, Cl. 198-20.00c.

Croisier, Alain [4 International Business Machines Corporation. Digital Phase detector. 3,825,737, Cl. 235-186.000.

Crook, Edward J., Jr., to American Hoist & Derrick Company. Two-piece swage fittings. 3,825,356, Cl. 403-122.000.

Croset, Michel; and Velasco, Gonzalo, to Thomson-CSF. Waveguide coupler having transparent stratified structure with aparallel faces. 3,825,318, Cl. 350-96.0wg.

Crosman Arms Company, Inc.: *See—*
Crane, James W.; and Hand, David R., 3,824,981.

Crowley, Richard P. Flame-retardant carpet and method of preparing same. 3,825,464, Cl. 161-67.000.

Crown Crafts, Inc.: *See—*
Hunt, Howard D., 3,825,435.

Crown Zellerbach Corporation: *See—*
Hoagland, John M.; Tokos, George M.; and Tonn, Edward G., 3,825,644.

Crucible Inc.: *See—*
Costello, Thomas M.; and Bressanelli, Jerome P., 3,825,417.

Cullen, Darrel F.: *See—*
Harris, Ronald E.; and Cullen, Darrel F., 3,824,678.

Cummings, Aaron E. One-hand operated ice cube tray. 3,825,219, Cl. 249-71.000.

Cuozzo, Albert R. Theft-resistant display case for tape cartridges or the like. 3,825,313, Cl. 312-135.000.

Curtis, Daniel L.: *See—*
LeVantine, Allan D.; and Curtis, Daniel L., 3,824,951.

Curtiss-Wright Corporation: *See—*
Sohn, Jesse S.; and Gunther, Louis A., 3,824,663.

Custom Machines, Inc.: *See—*
Wloszek, Joseph T., 3,824,883.

Cutler-Hammer, Inc.: *See—*
Meier, Paul, 3,825,863.

Cyclops Corporation, mesne: *See—*
Shingler, Thomas M., 3,825,098.

Dahl, Stanley M.: *See—*
Fisher, William T.; Patterson, Charles B.; and Dahl, Stanley M., 3,824,923.

Daicel Ltd.: *See—*
Kudo, Teizo; Ikeda, Saizo; Sonoyama, Yuzo; and Kotani, Motoharu, 3,825,625.

Daimler-Benz Aktiengesellschaft: *See—*
Barenyi, Bela, 3,825,297.
Hopf, Wilhelm, 3,825,099.
Kinast, Norbert, 3,825,891.
Schiesterl, Gerhard; and Wulf, Helmut, 3,825,278.

Dali, George J.; and White, William E., to Eastman Kodak Company. Shroud structure for a microfilm reader. 3,825,333, Cl. 353-75.000.

Damon, Neil F.; Laurence, Robert S.; and Hoy, Ralph C., to Augat, Inc. Electrical component mounting. 3,825,876, Cl. 339-17.0cf.

Damour, Lawrence R.: *See—*
Komorek, Anthony J.; and Damour, Lawrence R., 3,825,167.

Danfoss A/S: *See—*
Petersen, Carsten Georg Otto; and Giversen, Svend, 3,825,376.

Danner, Dean W., to GTE Automatic Electric Laboratories, Incorporated. Calling party control circuit. 3,825,699, Cl. 179-81.00r.

Darges, Walter; Karpis, John J.; Petitgout, George L.; and Witbeck, Walter G., to Boeing Company, The. Aircraft heating and ventilating system. 3,825,212, Cl. 244-118.00p.

Darin, John K.: *See—*
Bemis, Alan G.; Darin, John K.; and Hoff, Melvern C., 3,825,614.

Darling, William A. Labyrinth locking apparatus. 3,824,815, Cl. 70-18.000.

Dart Container Corporation: *See—*
Dart, William A.; and Davis, James R., 3,825,378.

Dart Industries, Inc.: *See—*
Campagna, Edward R., 3,825,141.
Campagna, Edward R., 3,825,142.
Swett, James B.; and Ashton, Harold P., 3,825,049.

Dart, William A.; and Davis, James R., to Dart Container Corporation. Mold apparatus. 3,825,378, Cl. 425-4.00r.

Dassler, Alfred, to Licentia Patent Verwaltungs-G.m.b.H. Inductive generator. 3,825,782, Cl. 310-168.000.

Data Interface, Inc.: *See—*
Ott, Owen J.; Ginn, David W.; and Miller, Lester F., Jr., 3,825,936.

David, Harry; and Rudszinat, Willy, to Hauni-Werke Koerber & Co. KG. Method and apparatus for measuring the rate of feed of fibrous material. 3,825,152, Cl. 222-1.000.

David Manufacturing Company: *See—*
Murphy, David M., 3,825,089.

Davidson, Edmund Benjamin, to RCA Corporation. Unsaturated polyester resin photoresist composition. 3,825,428, Cl. 96-91.00n.

Davidson, Maxwell, Limited: *See—*
Davidson, Maxwell Wingate, 3,825,382.

Davidson, Maxwell Wingate, to Davidson, Maxwell, Limited. Filter press. 3,825,382, Cl. 425-84.000.

Davies, Eric, to Marconi Company Limited, The. Radar provided with pulse repetition frequency discrimination. 3,825,930, Cl. 343-7.700.

Davies, John H.; and Davis, Royston H., to Shell Oil Company. Thiazole carbamate pesticides. 3,825,552, Cl. 260-302.00r.

Davis, James R.: *See—*
Dart, William A.; and Davis, James R., 3,825,378.

Davis, Michael I.: *See—*
Brown, Wendell W.; Davis, Michael I.; and Pipitone, Ralph M., 3,825,902.

Davis, Noel, to Integrated Development and Manufacturing Company. Method and apparatus for producing plants. 3,824,736, Cl. 47-17.000.

Davis, Richard P. Die for extrusion of lattice structures. 3,825,391, Cl. 425-362.000.

Davis, Royston H.: *See—*
Davies, John H.; and Davis, Royston H., 3,825,552.

Davis, Steven S., to Envirotech Corporation. Filter elements for continuous filters. 3,825,124, Cl. 210-330.000.

Davis, Ted C., to General Motors Corporation. Power supply control circuit for 120 volt combination washer and dryer. 3,824,813, Cl. 68-12.00r.

D.D.I. Communications, Inc.: *See—*
Long, Robert G., 3,825,696.
Long, Robert Gordon, 3,825,695.

De Buhr, Alfred P., to General Motors Corporation. Rectifier bridge silicon controlled rectifier trigger circuit. 3,825,812, Cl. 321-5.000.

De Carteret, Gerald A.: *See—*
Beery, Jack; and De Carteret, Gerald A., 3,825,251.

De Cotiis, C. John: *See—*
Evnas, John L.; De Cotiis, C. John; and Johnson, Victor P., 3,824,865.

de Gouville, Jean Bernard, to Etablissements Sourdillon, Matricage et Robinetterie de Precision. Gas burners, especially for domestic appliances. 3,825,404, Cl. 431-354.000.

De Pauw, Agnes Desiree Maria: *See—*
Ligtenberg, Martinus Adrianus Cornelis; Stevels, Albert Leendert Nicolaas; and De Pauw, Agnes Desiree Maria, 3,825,763.

D.E.A. Digital Electronic Automation S.p.A.: *See—*
Sartorio, Franco, 3,824,893.

Deane, Nicholas B. Rotary driving. 3,825,375, Cl. 418-61.00a.

Debaillie, Arnold A.: *See—*
Sorenson, Charles E.; Stubblefield, Clyde D.; Debaillie, Arnold A.; Bramley, Robert K.; and Bourassa, Hugh A., 3,824,772.

Debart, Hubert, to Compagnie General d'Electricite. Frequency modulation telemetry system. 3,825,340, Cl. 356-5.000.

Debski, Thomas R.; and Gaudio, Joseph G., to United States of America, Air Force. Spiral antenna stripline termination. 3,825,933, Cl. 343-895.000.

Decalock Limited: *See—*
Armstrong, Richard James, 3,825,289.

Deck, Fritz; and Keim, Norbert. Device for guiding a flat paint brush. 3,824,647, Cl. 15-248.00r.

Decker, Herbert, to Triumph Werke Nuernberg A.G. Type head tilt and rotating mechanism. 3,825,102, Cl. 197-55.000.

DeCoulos, John, to Boston Machine Works Co. Apparatus for applying welting to a shoe component. 3,824,643, Cl. 12-67.00k.

Deklerk, John, to Westinghouse Electric Corporation. Interdigital mosaic thin film shear transducer. 3,825,779, Cl. 310-9.800.

DelGiudice, Frank Paul: *See—*
Koleske, Joseph Victor; Roberts, Rene Marie-Joseph; and DelGiudice, Frank Paul, 3,825,620.

Delmotte, Roger Edmond, to Societe Anonyme des Usines de Callenelle en abrege Saluc. Process for the manufacturing of rackets for tennis and other similar games. 3,825,646, Cl. 264-257.000.

Delorme, Raymond Louis, to Societe Honeywell Bull (Societe Anonyme). Drive device for a flexible strip provided with marginal perforations. 3,825,161, Cl. 226-67.000.

Demi, Roy C., to Robertshaw Controls Company. Manifold arrangement and parts therefor or the like. 3,825,225, Cl. 251-363.000.

Denzel, Theodor; and Hoehn, Hans, to Squibb, E. R., & Sons, Inc. Hydrazines, hydrazides and hydrazones of isoxazolopyridine carboxylic acids and esters. 3,825,535, Cl. 260-240.00g.

Depperman, Warren B.: *See—*
Richards, Edward F.; and Depperman, Warren B., 3,825,739.

Descoins, Charles E.; and Henrick, Clive A., to Zoecon Corporation. Synthesis of 1-bromo-trans-3, trans-5-heptadiene. 3,825,607, Cl. 260-654.00r.

Deutsch Company Electronic Components Division: *See—*
Clark, Kenneth M., 3,824,681.

Deutsch Company Electronic Components Division, The: *See—*
Clark, Kenneth M., 3,824,670.

Deutsch Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Altenschopfer, Theodor; and Batka, Heimold, 3,825,498.

Deutsch, Herman: *See—*
Smith, William Ralph; and Deutsch, Herman, 3,825,693.

Devices Limited: *See—*
Lale, Peter Gilbert; and Becker, Denis John, 3,825,016.

Dewhurst, Ernest James. Cartons. 3,825,171, Cl. 229-52.00a.

Diamond, Julius; and Santora, Norman J., to Rorer, William H., Inc. Certain 5-arylthiazolidines. 3,825,553, Cl. 260-306.700.

Diamond, Julius; and Santora, Norman J., to Rorer, William H., Inc. Substituted phenylacetic acid compounds. 3,825,587, Cl. 260-501.160.

Diamond, Julius, to Rorer, William H., Jr. Thiopseudouronium compounds. 3,825,597, Cl. 260-564.00c.

Dice, Dennis D., to Electronic Data Controls Corporation. Simulated dice game and control circuit therefor. 3,825,857, Cl. 331-111.000.

Dickey, W. S., Clay Manufacturing Company: *See—*
Ligon, Elmer R.; and Reed, Norman D., 3,825,392.

Diersbock, Gunther Rudolph, to Timex Corporation. Horological movement employing inductive stepping motor. 3,824,781, Cl. 58-23.00r.

Dietz, Wolfgang Friedrich Wilhelm, to RCA Corporation. Raster correction circuit utilizing a parabolically varying load circuit. 3,825,793, Cl. 315-276.00d.

Dillard, John W.: *See—*
Tringali, Dominick; and Dillard, John W., 3,825,937.

Dimitracopoulos, Panayotis C. Audiovisual apparatus. 3,825,332, Cl. 353-19.000.

Dimroth, Peter: *See—*
Ruider, Guenther; and Dimroth, Peter, 3,825,527.

DiPaolo, Anthony George. Footwear. 3,824,716, Cl. 36-32.00r.

Dobrjanskyj, Lew; and Einhorn, Ruediger, to Coats & Clark, Inc. Combination padlock. 3,824,816, Cl. 70-25.000.

Dobson, Richard N.; and Webster, Gordon A., to Dominion Foundries & Steel Limited. Process for the fabrication of structural column members. 3,824,661, Cl. 29-155.00c.

Dockum, Arthur L. Miniature table model shuffleboard and shufflebowling game. 3,825,264, Cl. 273-126.00r.

Doering, Beauford C., to Par-Way Mfg. C. Liquid spray head. 3,825,188, Cl. 239-498.000.

Dolfi, James J., Sr. Line vacuum controlled manifold vacuum spoiler. 3,825,031, Cl. 137-480.000.

Dolfini, Joseph E.: *See—*
Perrella, Donald J.; and Dolfini, Joseph E., 3,825,536.

Dolfini, Joseph Edward; and Breauer, Hermann, to Squibb, E. R., & Sons, Inc. Alpha-phospho noacetylpenicillins. 3,825,529, Cl. 260-239.100.

Domain Industries, Inc.: *See—*
Crabb, Jasper R., 3,825,039.

Dombrowski, Frank R.: *See—*
Habegger, Richard; and Dombrowski, Frank R., 3,824,940.

Dominion Foundries & Steel Limited: *See—*
Dobson, Richard N.; and Webster, Gordon A., 3,824,661.

Donahue, Jerome T.; Hess, Walter F.; Knoebel, Gordon W.; and Sydow, Donald E., to Oconomowoc Mfg. Corporation. Method of fabricating a bearing assembly. 3,824,658, Cl. 29-148.40a.

Doolittle, Howard D., to Machlett Laboratories, Incorporated, The. Image intensifier with improved input screen. 3,825,787, Cl. 313-102.000.

Dorr, Richard L.; Ihnot, Edward G.; and Varner, Malcolm E., to International Business Machines Corporation. Multiple formatting for record-controlled machines. 3,825,726, Cl. 235-61.60r.

Douglas, Harley W.: *See—*
Graydon, Kenneth; and Douglas, Harley W., 3,825,092.

Dow Chemical Company, The: *See—*
Kurihara, Norman H.; and Bublitz, Donald E., 3,825,548.
McCrary, Avis L.; and Wilson, David A., 3,825,592.
McGaugh, Michael C., 3,825,627.
McGaugh, Michael Calvin, 3,825,626.
Walles, Wilhelm E., 3,824,762.

Dow, Ronald C., to Monocab, Inc. Circuit for sensing the absence of a safety ground in an electrically operated transport vehicle system. 3,825,915, Cl. 340-256.000.

Dowty Seals Limited: *See—*
Hillier, Edward Francis Herbert Benjamin; and Holmes, Anthony Roger, 3,825,643.

Dresser Industries, Inc.: *See—*
Herrick, David Burton, 3,825,366.

Drewry, Hugh S.: *See—*
Lesperance, Lawrence M.; Drewry, Hugh S.; and Vegners, Gunars, 3,824,694.

Drury, Raymond L., Jr.; Hines, James W.; and Nevin, Charles S., to Staley, A. E., Manufacturing Company. Film forming hydrophilic amide polymer compositions. 3,825,514, Cl. 260-29.6ta.

Drusch, Gaston Joseph. Converter of digital data into analogue data. 3,825,925, Cl. 340-347.oda.

Du Pont de Nemours, E. I., and Company: *See—*
England, David C., 3,825,599.
Traumann, Klaus Friedrich, 3,825,586.

Dubbe, Richard F.: *See—*
Bradford, Robert S.; Richardson, Harvey J.; Dubbe, Richard F.; and Ebbinga, Richard D., 3,825,675.

Duchatellier, Bernard Charles, to Rapid S.A. Electrical connection clip. 3,825,884, Cl. 339-244.00r.

Dueker, Leonard L.: *See—*
Sturgeon, Larry O.; and Ducker, Leonard L., 3,825,197.

Duerksen, Walter K.; Holcombe, Cressie E., Jr.; and Morrow, Margaret K., to United States of America, Atomic Energy Commission. Process for preparing sinterable aluminum titanate powder. 3,825,653, Cl. 423-598.000.

Dufetele, Jean-Louis: *See—*
Moret, Bernard; and Dufetele, Jean-Louis, 3,824,739.

Duffert, Heinrich, to Kraftwerk Union Aktiengesellschaft. Conductor bar for electrical machines. 3,825,783, Cl. 310-213.000.

Duffy, Daniel M.: *See—*
Burk, John L.; Duffy, Daniel M.; Hogan, Spurgeon G., Jr.; Larson, Russell H.; and McGilvray, Bruce L., 3,825,904.

DuKane Corporation: *See—*
Supitilov, Michael C., 3,825,481.

Dunlop Limited: *See—*
Holroyd, Eric; Goodfellow, Anthony G.; and McGlashen, James N., 3,825,457.

Dunn, Richard D.: *See—*
Gautraud, Michael G.; Gretzky, Anthony J.; Zachev, Ivan; Dunn, Richard D.; and Szymanski, Richard, 3,825,749.

Dunning, Charles E.; and Kellenberger, Stanley R., to Kimberly-Clark Corporation. Apparatus for forming airlaid webs. 3,825,381, Cl. 425-83.000.

Duperow, Donald E.; and Ferlin, William J., to Lincoln Brass Works, Inc. Gas burner. 3,825,402, Cl. 239-568.000.

Durden Enterprises, Ltd.: *See—*
Durden, John G. III, 3,825,004.

Durden, John G. III, to Durden Enterprises, Ltd. Disposable electrosurgical cautery. 3,825,004, Cl. 128-275.100.

Durham, Henry B. Cable bender. 3,824,834, Cl. 72-387.000.

Dykzeul, Theodore J., to Robertshaw Controls Company. Convertible burner with heating of flame sensing element. 3,825,399, Cl. 431-80.000.

Dynamic Nobel AG: *See—*
Schneider, Johannes; and Pungs, Wolfgang, 3,825,516.

Dynamit Nobel Aktiengesellschaft: *See—*
Kotzsch, Hans-Joachim; and Vahlensieck, Hans-Joachim, 3,825,567.

Dzioba, Donald L., to General Motors Corporation. Hydraulic motor having a hydraulic lock control drive pin. 3,824,899, Cl. 91-491.000.

Eades, George S.: *See—*
Knapp, Charles F.; and Eades, George S., 3,824,709.

Eastman Kodak Company: *See—*
Ames, William A.; and Ward, James J., 3,825,573.
Dali, George J.; and White, William E., 3,825,333.
Kosarko, Gerald Julius; Holzhauser, Ronald Charles; and Marvin, Edgar Samuel, 3,825,327.
Reynolds, Delbert Daniel; and Cossar, Bernard Calvin, 3,825,538.
Stockbridge, Bruce W.; and Spaller, Albert E., Jr., 3,824,827.
Wolf, Edward L., 3,825,807.

Eaton Corporation: *See—*
Freeman, Harvey, 3,825,100.
Grygera, James W., 3,825,768.
Grygera, James W., 3,825,846.

Ebbinga, Richard D.: *See—*

Bradford, Robert S.; Richardson, Harvey J.; Dubbe, Richard F.; and Ebbinga, Richard D., 3,825,675.

Ebert, Lloyd A. Method of applying a removable cover to an electrical insulator bushing. 3,824,676, Cl. 29-450.000.

Ebneter, Markus, to Ferd. Ruesch Maschinenfabrik, Firma. Printing mechanism with overdrive for the printing cylinder and inking rollers. 3,824,925, Cl. 101-212.000.

Eckert, Robert John, Jr.; and Laran, Roy Joseph, to Ciba-Geigy Corporation. Process for the preparation of cyanogen chloride. 3,825,658, Cl. 423-383.000.

Eckstein, Wolfgang. Filtering device for removing bacteria from the ventilation air. 3,824,770, Cl. 55-279.000.

Economy, James; and Matkovich, Vlado I., to Carborundum Company, The. Boron carbide fiber production. 3,825,469, Cl. 161-172.000.

Eda, Takeichi. Rotary type internal combustion engine. 3,824,963, Cl. 123-8.470.

Edel, Peter: *See—*
Heilmann, Fery; and Edel, Peter, 3,824,811.

Edison, Lamonte R., to General Motors Corporation. Electronic fuel injection system. 3,824,969, Cl. 123-32.0ea.

EG & G, Inc.: *See—*
O'Donnell, John R., 3,825,861.

Egan Machinery Company: *See—*
Willert, William H.; and Ro. Jai G., 3,824,875.

Egger, Michael E.: *See—*
Katchka, Jay R.; Hendrick, Fred W.; and Egger, Michael E., 3,825,398.

Egtvedt, Robert B., to Wolverine World Wide, Inc. Friction-type swivel shoe. 3,824,710, Cl. 36-7.5ae.

Eifler, Willi; and Finkel, Josef, to Bayer Aktiengesellschaft. Process for the production of polyamines. 3,825,598, Cl. 260-570.00d.

Einhell, Hans, Firma: *See—*
Thannhuber, Josef, 3,825,826.

Einhorn, Ruediger: *See—*
Dobrjanskyj, Lew; and Einhorn, Ruediger, 3,824,816.

Einighammer, Hans J.; and Hauke, Rudolf. Method for increasing the power X-ray tubes and apparatus for carrying out the method. 3,825,786, Cl. 313-60.000.

Eipeltauer, Eduard; Lauss, Hans-Dietrich; and Spreckelmeyer, Bernhard, to Bayer Aktiengesellschaft. Production of hydrogen fluoride and metal sulfates. 3,825,655, Cl. 423-485.000.

Eisele, Judith A.: *See—*
Heinen, Harold J.; Eisele, Judith A.; and Fischer, Dennis D., 3,825,651.

Eisemann, Kurt, to U.S. Philips Corporation. Shut-off device for a record changer. 3,825,269, Cl. 274-10.00r.

Eisenhardt, Fred W.; and Ellingson, Hartley N., to Alloway Manufacturing, Inc. Tool bar clamp. 3,825,358, Cl. 403-188.000.

Elbert, Donald L.; and Waldrip, Glen A., to International Business Machines Corporation. Adhesively eradicable transfer medium. 3,825,470, Cl. 161-227.000.

Electric Machinery Mfg. Company: *See—*
Smith, Forest D., 3,824,857.

Electricity Council, The: *See—*
Johnston, Philip Douglas; Lawton, James; and Mackison, Ian, 3,825,415.

Electro Marine Corporation: *See—*
Burns, Harold S., 3,825,911.

Electronic Data Controls Corporation: *See—*
Dice, Dennis D., 3,825,857.

Electronic Engineering Co. Of Calif.: *See—*
Yablonski, Robert E.; Hager, George S.; and Campbell, William G., Jr., 3,824,870.

Electronic Surveillance Corporation Limited: *See—*
Lawton, Richard A., 3,825,897.

Electronics Corporation of America: *See—*
Metcalf, Arthur G. B.; Guiffrida, Philip; and Bellows Alfred H., 3,825,913.
Thomson, E. Craig, 3,825,745.

Electrospace Corporation: *See—*
Meri, Kalju, 3,825,850.
Schacket, Robert, 3,825,914.
Waldman, Herbert H., 3,825,687.

Elektriska Svetsningsaktiebolaget: *See—*
Jonsson, Sven Jonas Roland, 3,825,719.

Elektro-Ion, Inc.: *See—*
Jensen, Frederick K.; and Jewell, Gordon W., 3,824,912.

Elia, Frederick J.; Brothers, Donald C.; Hofschild, Clewell; and Bryson, Robert A., to Harris-Intertype Corporation. Gathering machine and control therefor. 3,825,246, Cl. 270-58.000.

Ellingson, Hartley N.: *See—*
Eisenhardt, Fred W.; and Ellingson, Hartley N., 3,825,358.

Elliott, Harry Samuel: *See—*
Togneri, Mauro Giuseppe; and Elliott, Harry Samuel, 3,825,816.

Elliott, Kenneth Frederick: *See—*
Warman, Bloomfield James; Elliott, Kenneth Frederick; and Kennard, Jack Frederick, 3,825,800.

Emerjy: *See—*
Berthier, Georges, 3,825,703.

Emerson Electric Co.: *See—*
Wightman, Lawrance W., 3,824,668.

Emmick, Thomas L., to Lilly, Eli, and Company. Insect control employing compounds having juvenile hormone-like activity. 3,825,661, Cl. 424-278.000.

Endo, Ichiro: *See—*
Inoue, Eiichi, Shimizu, Isamu; Kobayashi, Hajime; and Endo, Ichiro, 3,825,427.

Engel, James F.: *See—*
Chappelow, Cecil C., Jr.; and Engel, James F., 3,825,585.

Engelsmann, Dieter; Maas, Dieter; and Schroder, Rolf, to Agfa-Gevaert Aktiengesellschaft. Film transporting mechanism for photographic camera. 3,825,939, Cl. 354-213.000.

England, David C., to Du Pont de Nemours, E. I., and Company. Perfluoromethylpropionylketene. 3,825,599, Cl. 260-585.500.

Engstrom, Keith A., to Illinois Tool Works Inc. Solid state switch structure. 3,825,908, Cl. 340-174.0pm.

Engstrom, Keith A.; Bernin, Victor M.; and Bury, George J., to Illinois Tool Works Inc. Solid state switch structure. 3,825,909, Cl. 340-174.0pm.

Enns, Mark K.: *See—*
Haley, Paul H.; and Enns, Mark K., 3,825,732.

Envirotech Corporation: *See—*
Davis, Steven S., 3,825,124.

Erdman, J. Gordon, to Phillips Petroleum Company. Fluid sampling apparatus. 3,824,858, Cl. 73-421.00r.

Erickson, Rodney R.; Hopkins, Donald L.; and Norick, William B., to Caterpillar Tractor Co. High pressure manifold coupling means. 3,825,287, Cl. 285-137.00r.

Erokhov, Veniamin Kuzmich: *See—*
Starostin, Jury Stepanovich; Plokhov, Viktor Ivanovich; Erokhov, Veniamin Kuzmich; Ivanov, Vladimir Prokopievich; Krotkov, Vladimir Nikolaevich; Anisimov, Albert Viktorovich; Ajupov, Rustem Nurievich; and Golovinov, Mikhail Fedortovich, 3,824,832.

Ershov, Boris Alexandrovich: *See—*
Smirnov, Mikhail Dmitrievich; Ershov, Boris Alexandrovich; Savitsky, Vladilen Nikolaevich; Breev, Boris DmitrievICH; Atkarsky, Anatoly Alexandrovich; Shardakov, Svyatoslav Viktorovich; Sinajuk, David Aronovich; Stukalov, Vladimir Nikolacvich; and Puzynya, eonid Vasilievich, 3,824,642.

ESAB-Hebe Aktiebolag: *See—*
Janson, David Wenzel Alexander, 3,824,737.

Essex International, Inc.: *See—*
Prouty, Robert E.; and Graf, Robert E., 3,825,865.

Esso Production Company: *See—*
Heilhecker, Joe K., 3,825,079.

Esso Production Research Company: *See—*
Heilhecker, Joe K.; Wood, Donald B.; and Heintz, Karl O., 3,825,078.
Lloyd, James R.; Williams, Robert E.; Bayless, Jack H.; Ortloff, Gerald D.; and Bruce, George H., 3,825,065.

Esso Research and Engineering Company: *See—*
Haisch, Richard A., 3,825,040.
Harding, John W.; Keller, James P.; and Buntin, Robert R., 3,825,380.
Howell, William G., 3,825,165.
Lohkamp, Dwight T.; and Keller, James P., 3,825,379.
Wadley, Edward F.; Wesselhoft, Robert D.; and Hanner, Glen P., 3,825,611.

Etablissement Public: Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Nomarski, Georges; and Roblin,Gerard, 3,825,348.

Etablissement Public: Agence Nationale de Valorisation de la Recherche Anvar: *See—*
Nomarski, Georges, 3,825,349.

Etablissements Genoud & Cie Societe Anonyme: *See—*
Chevallier, Pierre, 3,825,401.

Etablissements Sourdillon, Matricage et Robinetterie de Precision: *See—*
de Gouville, Jean Bernard, 3,825,404.

Etat Francais, Delegation Ministerielle pour l'Armement: *See—*
Martin, Gilbert, 3,825,444.

Etessam, Alexander Hossen. Intermittent combustion device with a pair of coextensive and coaxial mutually inductive chambers. 3,824,787, Cl. 60-248.000.

Ethyl Corporation: *See—*
Keblys, Kestutis A., 3,825,608.

Ettel, Hubert, to Mende, Wilhelm, & Co. Apparatus for coating chipboard with a laminated sheet or foil. 3,825,462, Cl. 156-582.000.

Eue, Ludwig: *See—*
Hofer, Wolfgang; Schliebs, Reinhard; Schmidt, Robert; and Eue, Ludwig, 3,825,635.

European Atomic Energy Community (Euratom): *See—*
Wurm, Joseph G.; and Heylen, Paul R., 3,824,673.

Eustace, Waymon Rhea: *See—*
Flarity, Frank O'Dell; and Eustace, Waymon Rhea, 3,825,083.

Evans, Ronald Arthur: *See—*
Boyd, Violet; Evans, Ronald Arthur; Holt, Kenneth Anthony; and Renfrew, Andrew Hunter Morris, 3,825,507.

Evnas, John L.; De Cotiis, C. John; and Johnson, Victor P., to Singer Company, The. Projectile having a gyroscope. 3,824,865, Cl. 74-5.60d.

Evtuhov, Viktor; Soffer, Bernard H.; and Tseng, David Y., to Hughes Aircraft Company. Enhanced field of view parametric image converter. 3,824,717, Cl. 307-88.300.

Ewing, Bruce A.; and Rizzo, Frank J., Jr., to Avco Corporation. Wrought superalloys. 3,825,420, Cl. 75-171.000.

Ex-Cell-O Corporation: *See—*

Bondie, Dale J.; Sutton, Robert S.; and Lewelling, James D., 3,824,892.

Facem Fabbrica Apparecchi Controllo e Misura di Gualtiero Brauer: *See—*
Brauer, Gualtiero, 3,825,704.

Fahralloy Company, The: *See—*
Fahrenwald, Francis M., 3,824,868.

Fahrenwald, Francis M., to Fahralloy Company, The. High temperature belt link construction. 3,824,868, Cl. 74-235.000.

Falk, David O.: *See—*
Norton, Charles J.; and Falk, David O., 3,825,068.
Norton, Charles J.; and Falk, David O., 3,825,069.

Faloon, William L., to General Motors Corporation. Control lever assembly. 3,824,948, Cl. 116-124.00r.

Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See—*
Weber, Helmut; Aumuller, Walter; Weyer, Rudi; Muth, Karl; and Schmidt, Felix Helmut, 3,825,665.

Farfaglia, Silvio T., to Phillips Petroleum Company. Hot air heater for carton sealing machine. 3,824,702, Cl. 34-104.000.

Farfaglia, Silvio T.; and Halpin, Robert G., to Phillips Petroleum Company. Hot air heater for carton sealing machine. 3,825,408, Cl. 432-230.000.

Farrell, Greg; Tsuji, Akira; Hasimoto, Dojun; Koto, Nobuhisa; and Hirai, Nobutake, to Mitsubishi Denki Kabushiki Kaisha. Film scanner. 3,825,679, Cl. 178-7.200.

Fatosme, Albert; and Coste, Henri. Building structure made of standardized components. 3,824,754, Cl. 52-228.000.

Fayet, Andre Barthelemy Marie, to Tri-Cology, Inc., mesne. Extrusion method and apparatus. 3,825,645, Cl. 264-177.000.

Fechheimer, Paul R., to A-T-O Inc. Filling machine for containers. 3,825,043, Cl. 141-147.000.

Felder, Ernst; and Pitre, Davide, to Bracco Industria Chemica Societa per Azioni. Orally applicable contrast agents for cholecystography. 3,825,591, Cl. 260-519.000.

Felix, Dan T.: *See—*
Pelofsky, Arnold H.; Felix, Dan T.; and Herbert, Gary N., 3,825,480.

Feller, Ron, to Israel, Ministry of Agriculture, The State of. Oscillating screen. 3,825,118, Cl. 209-330.00.

Felsberg, Robert Irving; and Miedema, Hotze, to Bell Telephone Laboratories, Incorporated. Selective distortion compensation circuit. 3,825,843, Cl. 328-163.000.

Fenton, Donald M., to Union Oil Company of California. Alkylation of heterocyclic compounds. 3,825,545, Cl. 260-283.00r.

Fenton, Leonard, to Marlen Manufacturing and Development Co. Resealable closure for ileostomy bag. 3,825,005, Cl. 128-283.000.

Ferd. Ruesch Maschinenfabrik, Firma: *See—*
Ebneter, Markus, 3,824,925.

Ferlin, William J.: *See—*
Duperow, Donald E.; and Ferlin, William J., 3,825,402.

Fernandez-Rana; and Mebus, Henry R., to Harris-Intertype Corporation. Rotary gathering machine. 3,825,247, Cl. 270-58.000.

Ferro Corporation: *See—*
Meek, William H., 3,825,593.

Ferrraro, Dominic, to Chisholm-Ryder Company, Inc. Viner. 3,825,018, Cl. 130-30.00h.

FIAT Societa per Azioni: *See—*
Peruglia, Marco, 3,825,032.

Fibra-Sonics, Inc.: *See—*
Murry, Edward J., 3,825 887.

Ficarra, Bartholomew M., to Reichhold Chemicals, Inc. Thermosetting polyester molding compositions and method of preparation. 3,825,517, Cl. 260-40.00r.

Fike Metal Products Corporation: *See—*
Connor, John S.; and Pugh, Robert E., 3,825,766.

Fikentscher, Rolf: *See—*
Uhl, Guenter; Oppenlaender, Knut; Fikentscher, Rolf; and Mueller, Richard, 3,825,431.

Finger, Carl; and Pausche, John W., to Motorola, Inc. Flexible flat cable system. 3,825,878, Cl. 339-17.00f.

Fink, Werner, to ITT Industries, Inc. Differential-lock type device for a motor vehicle. 3,825,306, Cl. 303-21.0be.

Finkel, Josef: *See—*
Eifler, Willi; and Finkel, Josef, 3,825,598.

Finn, Lawrence R.; and Smith, Richard L., to Owens-Corning Fiberglas Corporation. Method and apparatus for handling stackable bodies. 3,824,759, Cl. 53-24.000.

Fischer & Porter Co.: *See—*
Yard, John S., 3,824,856.

Fischer, Dennis D.: *See—*
Heinen, Harold J.; Eisele, Judith A.; and Fischer, Dennis D., 3,825,651.

Fischer, Georg, Aktiengesellschaft: *See—*
Lustenberger, Hans, 3,825,240.

Fishburne International, Inc.: *See—*
Hart, Joel C.; and Traughber, Charles W., Jr., 3,824,758.

Fisher, William T.; Patterson, Charles B.; and Dahl, Stanley M., to Purex Corporation, Ltd. Electrostatic printing apparatus having improved counter-electrode. 3,824,923, Cl. 101-114.000.

Fitzpatrick, William B. P.: *See—*
Branovich, Louis E.; Fitzpatrick, William B. P.; and Long, Martin L., Jr., 3,825,440.

Fixtures Mfg. Corporation: *See—*
Lieberman, Edgar M.; and Snyder, Bobbie L., 3,825,300.

Flaherty, John J.; and Strauts, Eric J., to Magnaflux Corporation. Gate circuit for non-destructive testing systems for indicating when test signals lie within predetermined limits. 3,825,820, Cl. 324-37.000.

Flanders, Harry E., Jr., to Burlington Industries, Inc. Heating procedure in an false twist texturizing process. 3,824,778, Cl. 57-157.0ts.

Flarity, Frank O'Dell; and Eustace, Waymon Rhea, to Christensen Diamond Products Company. Drill bit and stabilizer combination. 3,825,083, Cl. 175-394.000.

Fleissner, Heinz, to Vepa AG. Device for the treatment of lengths of textile material. 3,824,814, Cl. 68-18.00r.

Fleming, Howard B. Brackets attachable to an outside bridge girder. 3,825,217, Cl. 248-205.00r.

FMC Corporation: *See—*
Bloomquist, George W., 3,825,045.

Foote, Robert S.: *See—*
Johnson, Claiborne H., Jr.; and Foote, Robert S., 3,825,751.

Ford, Emory A., to Monsanto Company. Method of graft polymerization and polymers produced thereby. 3,825,621, Cl. 260-878.00r.

Ford, Reginald G., to Cities Service Oil Company. Demistor. 3,824,767, Cl. 55-20.000.

Forgo, Laszlo: *See—*
Heller, Laszlo; Forgo, Laszlo; and Horvath, Mihaly, 3,825,060.
Heller, Laszlo; Forgo, Laszlo; and Bodas, Janos, 3,825,062.

Forney, Edgar Wilmot, Jr., to AMP Incorporated. Method of terminating a semi-rigid coaxial cable. 3,824,686, Cl. 29-628.000.

Forss, Kaj G.; and Pirhonen, Ilpo M. J. Method for fractionation. 3,825,526, Cl. 260-124.00r.

Forster, Friedrich M. O. Apparatus for inspecting the quality of short, electrically conductive workpieces by the eddy current test method. 3,825,822, Cl. 324-40.000.

Forster, Friedrich Martin. Magnetic paricle flaw detector using an electron beam scanner to generate pulses representative of the image of the flaw projected on the scanner screen. 3,825,821, Cl. 324-38.000.

Foster, John; and Walker, Richard John, to Amalgamated Dental Company, Limited, The. Dental filling materials. 3,825,518, Cl. 260-42.520.

Foster Wheeler Corporation: *See—*
McMahon, Joseph F., 3,825,477.

Foulletier, Louis: *See—*
Lalu, Jean-Pierre; and Foulletier, Louis, 3,825,577.

Foxhall, Ollie C., to Joco, Incorporated. Inflation device. 3,824,849, Cl. 73-146.800.

Fraiman, Yakov Iosifovich. Kenaf cardboard and method for production thereof. 3,825,471, Cl. 162-147.000.

Franklin, Kenneth John; and Bates, Keith, to Medical Alginates Limited. Manufacture of alginic material. 3,824,997, Cl. 128-156.000.

Fraze, Ermal C.: *See—*
Brown, Omar L.; and Schubert, James R., 3,825,149.

Freedman, Jules, to Colgate-Palmolive Company. 4H(1)benzopyrano(3,4-d)isozazole. 3,825,539, Cl. 260-247.50r.

Freeman, Harvey, to Eaton Corporation. Hoist with constant pressure one way brake. 3,825,100, Cl. 188-71.200.

Frei, Armin H.; Schindler, Hans R.; and Vettiger, Peter, to International Business Machines Corporation. Method and device for coding and decoding video signals. 3,825,832, Cl. 325-38.00b.

Fremand, Michel: *See—*
Kiatipoff, Edmond, 3,825,304.

Frewer, Werner. Artery clamp. 3,825,011, Cl. 128-346.000.

Friedman, Aaron G.: *See—*
Friedman, Abraham; and Friedman, Aaron G., 3,825,740.

Friedman, Abraham; and Friedman, Aaron G. Rechargeable flashlight and support stand therefor. 3,825,740, Cl. 240-10.6ch.

Friedman, Alfred S.: *See—*
Watkin, Theodore, 3,824,671.

Friedman, Maurice W.: *See—*
Watkin, Theodore, 3,824,671.

Friedman, Sidney J.: *See—*
Herman, David; and Friedman, Sidney J., 3,824,913.

Friedrichsen, Thomas: *See—*
Miller, Wendell V.; and Friedrichsen, Thomas, 3,824,724.

Friedrichsen, Thomas, to Massillon-Cleveland-Akron Sign Company, The. Pole banner sign construction. 3,824,725, Cl. 40-125.00g.

Friend, Lindsay C. Singulator device for letter mail. 3,825,248, Cl. 271-10.000.

Frierman, E. Michael. Floor type billiard game with compensating pocket density arrangement. 3,825,258, Cl. 273-2.000.

Frohman-Bentchkowsky, Dov, to Intel Corporation. Electrically alterable floating gate device and method for altering same. 3,825,946, Cl. 357-23.000.

Frommer, Moshe-Aharon: *See—*
Brown, Clinton E.; and Frommer, Moshe-Aharon, 3,825,493.

Froning, H. Robert: *See—*
Murphy, Robert P.; and Froning, H. Robert, 3,825,752.

Fronsman, Lewis N.; and Fronsman, Nathan F. Electrolytic regenerator for chemical etchants including scraper means and rotating cathodes. 3,825,484, Cl. 204-216.000.

Fronsman, Nathan F.: *See—*
Fronsman, Lewis N.; and Fronsman, Nathan F., 3,825,484.

Fruehauf Corporation: *See—*
Cooper, George W., 3,825,128.

Fruth, Hans; and Muller, Wolfgang, to Siemens Aktiengesellschaft. Shut-off mechanism for low pressure lines connected to high pressure lines in nuclear reactors. 3,825,084, Cl. 176-65.000.

Frye, James A.; and Morton, Ralph B., to Boardman Company, The. Safe geometry nuclear fuel powder blender. 3,825,230, Cl. 259-3.000.

Fuger, Karl E.: *See—*
Burk, Emmett H.; and Fuger, Karl E., 3,825,554.

Fuji Photo Film Co., Ltd.: *See—*
Tamai, Yasuo, 3,825,421.

Fuji Xerox Co., Ltd.: *See—*
Fujite, Yasuhiro; Fujiwara, Hitoshi; and Yamasawa, Mitio, 3,825,407.

Fujii, Masao: *See—*
Miyazato, Takanori; Nakayama, Keiichi; and Fujii, Masao, 3,825,890.

Fujimoto, Keimei: *See—*
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Okuno, Yositosi; Ogawa, Taizo; Wakatsuki, Toshiyuki; and Nishizawa, Yoshihiko, 3,825,633.

Fujimoto, Keimei; Hirano, Masachika; Takeda, Hisami; and Ooba, Shigehiro, to Sumitomo Chemical Company, Limited. N-phenylthiocarbamoylthiohydroximate pesticides. 3,825,579, Cl. 260-453.00r.

Fujita, Yutaka: *See—*
Ashida, Takao; Kurihara, Osamu; Nawata, Kiyoshi; Shinoki, Takanori; Fujita, Yutaka; Yamashita, Gentaro; and Saiki, Noritsugu, 3,825,508.

Fujita, Yutaka; Naruchi, Tatsuyuki; Honda, Yuitsu; Ishimaru, Kenji; and Yoshisato, Eishin, to Teijin Limited. Process for the preparation of ε-caprolactone. 3,825,570, Cl. 260-343.000.

Fujite, Yasuhiro; Fujiwara, Hitoshi; and Yamasawa, Mitio, to Fuji Xerox Co., Ltd. Heater holding bracket for a heat fixer in a copying machine or the like. 3,825,407, Cl. 432-227.000.

Fujitsu Limited: *See—*
Kobayashi, Kengo; Manabe, Mitsuo; and Isobe, Shinichi, 3,825,731.

Fujiwara, Hitoshi: *See—*
Fujite, Yasuhiro; Fujiwara, Hitoshi; and Yamasawa, Mitio, 3,825,407.

Fukuda, Makoto: *See—*
Murayama, Naohiro; and Fukuda, Makoto, 3,825,519.

Fukuyama, Yasuo, to Yamauchi Rubber Industry Co., Inc. Printing magnetic saddle. 3,824,926, Cl. 101-378.000.

Fulton, Clyde E., to Caterpillar Tractor Co. Releasable mounting for cylindrical objects. 3,825,359, Cl. 403-192.000.

Furrey, John H.; and LeCrenn, George C., to Warwick Electronics Inc. Color gamut compressor. 3,825,673, Cl. 178-5.4he.

Furukawa Company Limited, The: *See—*
Shiroyama, Kaisuke; and Yokoyama, Takeo, 3,824,798.

Furuya, Tetsuo; Ibe, Yoshio; Kanisawa, Hideo; and Sugino, Osakazu, to Konishiroku Photo Industry Co., Ltd. Fogged, direct-positive silver halide emulsion containing as stabilizer a bisulfite addition product of an aldehyde. 3,825,429, Cl. 96-108.000.

Futaki, Kiyoshi; and Motoki, Masaya, to Mitsubishi Paper Mills, Ltd. Heat sensitive recording material. 3,825,432, Cl. 106-21.000.

G & S Mold & Die, Inc.; d/b/a AAA Tool & Die: *See—*
Sesto, Peter Joseph, 3,825,385.

Gabler, Helmut: *See—*
Schneider-Arnoldi, Alfred; Gabler, Helmut; and Kandler, Joachim, 3,825,433.

Gaj, Bernard J.: *See—*
Sello, Stephen B.; and Gaj, Bernard J., 3,825,630.

Galich, Thomas Patrick. Joint apparatus for sectioned skis or the like. 3,825,360, Cl. 403-294.000.

Galion, Jeffrey, Inc.: *See—*
Knight, Lloyd K., 3,825,192.

Gallagher, John D. Aircraft approach guide. 3,825,180, Cl. 235-78.000.

Ganiaris, Neophytos, to Struthers Patent Corporation. Wash of ice crystals. 3,824,799, Cl. 62-123.000.

Garcia, Felipe: *See—*
Katz, Carlos; Garcia, Felipe; and Allam, Ebayed, 3,825,670.

Gardner, Guy F.; and Boyak, Arnold C., to Massey-Ferguson Inc. Spring cushion shank mounting assembly. 3,825,073, Cl. 172-710.000.

Gargas, Frank A., to Storyboard Display, Inc. Multiple transparency display unit and sequencing control therefor. 3,824,723, Cl. 40-106.100.

Gargiuolo, Francesco, to Alfa Farmaceutici, S.p.A. Production of Cephalosporin C. 3,825,473, Cl. 195-36.00r.

Garrett, Lewis B. Electrical plug with selectable grounding terminals. 3,825,875, Cl. 339-14.0rp.

Gartner, Karlheinz, to Automation fur Grafische Technik BmbH. Synchronized paper web transport and connecting strap cutting and positioning apparatus. 3,824,907, Cl. 93-1.00r.

Gatland, Geoffrey H.; and Robitaille, Kenneth L., to Vemco Products, Inc. Garage door power operator having partial open capability. 3,825,809, Cl. 318-282.000.

Gatsis, John G., to Universal Oil Products Company. Process for hydrorefining a hydrocarbon charge stock. 3,825,488, Cl. 208-212.000.

Gattuso, Marion J., to University Oil Products Company. Manufacture of N-arylthiazole-2-sulfenamide. 3,825,550, Cl. 260-302.00s.

Gaucher, Romeo Oliva. Lawn swing. 3,825,299, Cl. 297-157.000.

Gaudio, Joseph G.: *See—*
Debski, Thomas R.; and Gaudio, Joseph G., 3,825,933.

Gautraud, Michael G.; Gretzky, Anthony J.; Zachev, Ivan; Dunn, Richard D.; and Szymanski, Richard, to Brunswick Corporation. Photoelectric pinfall detection system. 3,825,749, Cl. 250-222.00r.

Gavin, David F.: *See—*
Gay, Walter A.; and Gavin, David F., 3,825,581.

Gay, Walter A.; and Gavin, David F., to Olin Corporation. Production of monochloroacetonitrile. 3,825,581, Cl. 260-465.700.

Gebeshuber, Johann; and Meusel, Wilhelm, to Maschinenfabrik Augsburg-Nurnberg, Aktiengesellschaft Werk Nurnberg. Device for holding test head. 3,824,843, Cl. 73-71.5us.

Gebr. Bohler & Co., AG: *See—*
Marchard, Gustav, 3,824,887.

Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H.: *See—*
Hussmann, Jurgen; and Kurth, Dieter, 3,825,236.

Gebr. Hofmann KG: *See—*
Goebel, Eickhart, 3,824,861.

Geiger, Friedrich. Spring-type exerciser. 3,825,252, Cl. 272-82.000.

Geis, Warren P., to Koehring Company. Means for locking forklift truck forks in stored position. 3,825,139, Cl. 214-731.000.

Genbauffe, Francis S., to Robertshaw Controls Company. Plural range pressure regulator construction or the like and the method of making the same or the like. 3,825,029, Cl. 137-271.000.

General Electric Company: *See—*
Baumann, Frederick William; Kaczkowski, Bernard Ceasar; Rosenberry, George Mowry, Jr.; and Smith, William R., 3,825,057.
Habegger, Richard; and Dombrowski, Frank R., 3,824,940.
Halila, Ely E.; and Sterman, Albert P., 3,825,364.
Hall, Robert N., 3,825,759.
Harris, Lawson P., 3,825,789.
Hunter, Richard F.; and Truitt, Robert B., 3,825,148.
Jaquiss, Donald B. G., 3,825,562.
Jenkins, Thomas E., 3,825,373.
Kivistik, Olev, 3,825,773.
Prada, Luis E., 3,824,805.
Redington, Rowland W.; and Van Heerden, Pieter J., 3,825,795.
Rhudy, Ralph Gene, 3,824,683.
Woods, Lee O., 3,825,781.

General Motors Corporation: *See—*
Ballantyne, David B., 3,824,675.
Campbell, Robert E.; Hetzler, Lewis R.; and Huntzinger, Gerald O., 3,824,977.
Cole, Edward N.; and Niepoth, George W., 3,824,788.
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Noponen, Harold W.; and Miller, Tom B., 3,825,147.
Runkle, Donald L.; and Hughes, Charles N., 3,825,090.
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Scherer, Carl A.; and Richards, Gary E., 3,824,802.
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Stockbridge, John M., 3,825,109.
Unterborn, Ralph D.; Bodem, Roy C.; and Wanner, Joseph W., 3,825,243.
Wiese, Dennis M.; and Sawicki, Raymond P., 3,825,912.

General Partitions Mfg. Corp.: *See—*
Zehner, George M., Jr., 3,824,747.

General Signal Corporation: *See—*
Sibley, Henry C.; Auer, John H., Jr.; and Smith, Willis R., 3,825,744.

General Tire & Rubber Company, The: *See—*
Lowe, Jere L., 3,824,660.

Georges, Claude, to Societe Industrielle du Metal Usine. Driving device for a tubular axle. 3,824,874, Cl. 74-626.000.

Georgievich, Mikhail: *See—*
Yakovlevich, Otari; Nikolaevich, Robert; Isidorovich, Ivan; and Georgievich, Mikhail, 3,825,718.

Georgopulos, Thomas, to GTE Automatic Electric Laboratories, Incorporated. Electrical protectors and methods of assembling the same. 3,825,867, Cl. 337-32.000.

Geratsdorfer, Edmund, to U.S. Philips Corporation. X-ray apparatus for displaying in slow motion tissues which move with the rhythm of the heart. 3,825,761, Cl. 250-402.000.

Gerward, Christer: *See—*
Stolt, Jan; and Gerward, Christer, 3,824,872.

Geschickter Fund for Medical Research: *See—*
Rice, Leonard M., 3,825,546.

Geselbracht, Thomas H.; and Vinton, David S., to Caterpillar Tractor Company. Hydraulic fluid circuit for vehicle having articulated sections. 3,825,091, Cl. 180-53.00r.

Getscher, Phillip E.; and Hesser, Henry G., said Hesser assor. of 1/2 to Villiers, Elizabeth A. Trochanteric plate. 3,824,995, Cl. 128-92.00b.

Geurts, Melle F.: *See—*
McArthur, Ralph F.; Geurts, Melle F.; and Kelleher, John M., 3,825,285.

Giarrusso, Frederick F.: *See—*
Cimarusti, Christopher M.; Giarrusso, Frederick F.; and Levine, Seymour D., 3,825,566.

Gibbs, Francis E., to Kaiser Aluminum & Chemcal Corporation. Welding process. 3,825,712, Cl. 219-137.000.

Gibson, John: *See—*
Hinley, John James; and Gibson, John, 3,825,388.

Gilbert, Harold James; and Holt, Malcolm Robert, to Wickman Machine Tool Sales Limited. Mechanism for positioning a rotatable spindle at a predetermined angular setting. 3,824,884, Cl. 82-30.000.

Gillham, Richard D.: *See—*
Guffey, John W.; and Gillham, Richard D., 3,824,692.

Gilman, Robert W., to California Pellet Mill Company. Quick-change die and roller assembly. 3,825,387, Cl. 425-182.000.

Ginn, David W.: *See—*
Ott, Owen J.; Ginn, David W.; and Miller, Lester F., Jr., 3,825,936.

Giovanni, Sesto S.: *See—*
Vargiu, Silvio; Giovanni, Sesto S.; and Pitzalis, Mario, 3,825,522.

Givens, Wyatt W., to Mobil Oil Corporation. Method for providing a natural gamma-ray log in conjunction with assay operations within a borehole. 3,825,753, Cl. 250-265.000.

Giversen, Svend: *See—*
Petersen, Carsten Georg Otto; and Giversen, Svend, 3,825,376.

GK Systems, Inc.: *See—*
Irving, Edgar W., Jr., 3,825,121.

Gladwin, Floyd R. Compactor cabinet shield. 3,824,920, Cl. 100-53.000.

Glancy, Jack L.: *See—*
Green, B. Sherman; Green, Charles K.; Glancy, Jack L.; Myrick, Floyd J.; Norlander, Carl William; and Smith, Rodney E., 3,824,916.

Glantz, Hershey. Auxiliary reservoir for fluid in a hydraulic brake system. 3,825,042, Cl. 141-95.000.

Glasrock Products, Inc.: *See—*
Carter, Edward W., 3,825,506.

Glassman, Jacob A. Electrically conductive covering for shoes. 3,824,714, Cl. 36-7.10r.

Glaxo Laboratories Limited: *See—*
Gregory, Gordon Ian; and Weir, Niall Galbraith, 3,825,565.

Glover, Lenora Wood. Table cover. 3,825,050, Cl. 150-52.00r.

Goadby, Walter: *See—*
Canderton, Norman Victor; and Goadby, Walter, 3,824,809.

Godlewski, Robert E.: *See—*
Robeson, Lloyd M.; Pilato, Louis A.; and Godlewski, Robert E., 3,825,622.

Goebel, Eickhart, to Gebr. Hofmann KG. Apparatus for detecting and measuring imbalance of a motor vehicle wheel on a motor vehicle. 3,824,861, Cl. 73-457.000.

Goff, Howard G. Faller bar construction. 3,824,651, Cl. 19-129.00r.

Goffe, William L. Envelope opener. 3,824,688, Cl. 30-294.000.

Golden, Clara Celia. Bed cover. 3,824,640, Cl. 5-334.00c.

Golnek, Bryan R., Sr.; and Walton, Ronald M., to International Business Machines Corporation. Integrated diagnostic tool. 3,825,901, Cl. 340-172.500.

Golovinov, Mikhail Fedortovich: *See—*
Starostin, Jury Stepanovich; Plokhov, Viktor Ivanovich; Erokhov, Veniamin Kuzmich; Ivanov, Vladimir Prokopievich; Krotkov, Vladimir Nikolaevich; Anisimov, Albert Viktorovich; Ajupov, Rustem Nurievich; and Golovinov, Mikhail Fedortovich, 3,824,832.

Gonzalez, Robert E.; and Strenglein, Harry G., to Sperry Rand Corporation. Phase front detection system. 3,825,931, Cl. 343-100.0ap.

Goodfellow, Anthony G.: *See—*
Holroyd, Eric; Goodfellow, Anthony G.; and McGlashen, James N., 3,825,457.

Goodrich, B. F., Company, The: *See—*
Berens, Alan R.; and Paxton, Thomas R., 3,825,434.
Miller, Richard K., 3,825,509.

Goran, Michael B.: *See—*
Kasselmann, John T.; and Goran, Michael B., 3,825,308.

Gordon, Colin C., to General Motors Corporation. Electronic fuel injection system. 3,824,967, Cl. 123-32.0ea.

Gorman, Robert H., to King Instrument Corporation. Splicing head assembly. 3,825,461, Cl. 156-502.000.

Gosling, Raymond John: *See—*
Billows, Leonard Kay; and Gosling, Raymond John, 3,824,828.

Goto, Kenya, to Tokyo Shibaura Electric Co., Ltd. Doppler radar using laser. 3,825,341, Cl. 356-28.000.

Goto, Tatsuo: *See—*
Inoyama, Tadao; Goto, Tatsuo; and Takeyasu, Kiyoo, 3,824,674.

Goto, Toshinori: *See—*
Someya, Teruo; Kobayashi, Nobuyuki; and Goto, Toshinori, 3,825,839.

Gottschall, Herbert, to Schwank GmbH. Burner plate for infrared radiator. 3,825,403, Cl. 431-328.000.

Grabb, Frederick G.; and Beck, Mark E., to Bendix Corporation, The. Vacuum intensified brake booster system. 3,824,792, Cl. 60-411.000.

Grace, W. R. & Co.: *See—*
O'Neill, Gerald J.; Simons, Charles W.; and Billings, Charles A., 3,825,606.

Gracia, Robert F.; Laughrey, Richard A.; and Tuohey, Paul F., to Itek Corporation. Process for transparent photographic images. 3,825,424, Cl. 96-48.0pd.

Graf, Robert E.: *See—*
Prouty, Robert E.; and Graf, Robert E., 3,825,865.

Granatek, Edmund Stanley: *See—*
Vogan, John Edward; and Granatek, Edmund Stanley, 3,825,528.

Grant, James L. Physio-therapy method and apparatus. 3,824,993, Cl. 128-25.00r.

Grapentin, Kurt: *See—*
Preisler, Eberhard; Grapentin, Kurt; Harmsen, Ernst; and Harnisch, Heinz, 3,825,652.

Graven, William J., to MGM Hospital Supplies, Inc. Balloom catheter. 3,825,013, Cl. 128-349.00b.

Gray, Charles D.: *See—*
Aust, John J.; and Gray, Charles D., 3,825,170.

Graydon, Kenneth; and Douglas, Harley W. Safety device for mobile conveyances. 3,825,092, Cl. 180-82.00c.

Green, Angelica G., to Kimberly-Clark Corporation. Disposable gown with multiple flaps and closures. 3,824,625, Cl. 2-114.000.

Green, B. Sherman; Green, Charles K.; Glancy, Jack L.; Myrick, Floyd J.; Norlander, Carl William; and Smith, Rodney E., to Udico Electric Company. Bacon cooker. 3,824,916, Cl. 99-334.000.

Green, Charles K.: *See—*
Green, B. Sherman; Green, Charles K.; Glancy, Jack L.; Myrick, Floyd J.; Norlander, Carl William; and Smith, Rodney E., 3,824,916.

Green, Derek, to United Kingdom Atomic Energy Authority. Forming of materials. 3,824,825, Cl. 72-60.000.

Greene, Leonard M. Ski binding. 3,825,273, Cl. 280-11.35k.

Greenwood, Arthur R., to Universal Oil Products Company. Particle disengaging and fines removal. 3,825,116, Cl. 209-141.000.

Gregory, Gordon Ian; and Weir, Niall Galbraith, to Glaxo Laboratories Limited. 3α-Hydroxy-^{4}-steroids -Hydroxy- U4-steroids of the pregnone series and esters thereof. 3,825,565, Cl. 260-397.400.

Gresky, Alan T.; Savolainen, Jouko E.; McDuffee, William T., Jr.; and Wischow, Russell P., to United States of America, Atomic Energy Commission. Process for separation of protactinium, thorium and uranium from neutron-irradiated thorium. 3,825,649, Cl. 42-4.000.

Gretag Aktiengesellschaft: *See—*
Mast, Fred, 3,825,322.

Gretzky, Anthony J.: *See—*
Gautraud, Michael G.; Gretzky, Anthony J.; Zachev, Ivan; Dunn, Richard D.; and Szymanski, Richard, 3,825,749.

Greutman, William J. Wire stretcher. 3,825,228, Cl. 254-71.000.

Griffith, John Q., III: *See—*
Newingham, Thomas D.; Recchuite, Alexander D.; Griffith, John Q., III; and Haseltine, Marcus W., Jr., 3,825,495.

Grosko, John A.; Short, Melvin G.; and Stull, James T., to United States Steel Corporation. Apparatus for handling and top-charging a starter bar. 3,825,056, Cl. 164-274.000.

Gross, William J.: *See—*
Pitkanen, Alan R.; Kennedy, Melvin R.; Nagel, Dietmar; Gross, William J.; and Bosley, Denis V., 3,825,265.

Grosseau, Albert, to Societe Anonyme Automobiles Citroen. Device for automatically controlling a gearbox. 3,824,878, Cl. 74-866.000.

Gruber, Robert J.; and Grushkin, Bernard, to Xerox Corporation. Imaging process. 3,825,422, Cl. 96-1.0pe.

Grumman, Aerospace Corporation: *See—*
Leftheris, Basil P., 3,824,824.

Grushkin, Bernard: *See—*
Gruber, Robert J.; and Grushkin, Bernard, 3,825,422.

Grygera, James W., to Eaton Corporation. Phase sequence and power loss detector. 3,825,768, Cl. 307-127.000.

Grygera, James W., to Eaton Corporation. Signal isolator having feedback control. 3,825,846, Cl. 330-9.000.

Grzybowski, Alicja: *See—*
Grzybowski, Andrzej; and Grzybowski, Alicja, 3,825,262.

Grzybowski, Andrzej; and Grzybowski, Alicja. Hand-held amusement device with tethered ball and plural targets. 3,825,262, Cl. 273-97.00r.

GTE Automatic Electric Laboratories, Incorporated: *See—*
Danner, Dean W., 3,825,699.
Georgopulos, Thomas, 3,825,867.
Herron, Roger G.; and Hon, Stanley F., 3,825,824.
Jacobs, Melvin A., 3,825,701.
Kelly, Michael J.; Kobylar, Alex W.; and Rekiere, Bernard J., 3,825,690.
Maruscak, John; and Sine, Dale E., 3,824,722.
Pitroda, Satyan G.; and Rekiere, Bernard J., 3,825,683.

GTE International Incorporated: *See—*
Warman, Bloomfield James; Elliott, Kenneth Frederick; and Kennard, Jack Frederick, 3,825,800.

GTE Sylvania Incorporated: *See—*
Levin, Robert E., 3,825,742.

Gueldenpfennig, Klaus; Pommerening, Uwe A.; and Russell, Stanley L., to Stromberg-Carlson Corporation. Simplified conference facility for PBX. 3,825,692, Cl. 179-18.0bc.

Guffey, John W.; and Gillham, Richard D. Lift planning apparatus. 3,824,692, Cl. 33-1.0aa.

Guiffrida, Philip: *See—*

Metcalf, Arthur G. B.; Guiffrida, Philip; and Bellows Alfred H., 3,825,913.

Gulf Research & Development Company: *See*—
Cahoy, Roger Paul, 3,825,662.
Kobylinski, Tadeusz P.; and Taylor, Brian W., 3,825,654.
Sanjean, John; and Cahoy, Roger P., 3,825,663.

Gunther, Louis A.: *See*—
Sohn, Jesse S.; and Gunther, Louis A., 3,824,663.

Gustison, Robert A.; Bernhardt, Harvey A.; Barber, Eugene J.; and Benton, Samuel T., to United States of America, Atomic Energy Commission. Decontaminating uranium by reaction with CLF and HF and volatizing the UF product. 3,825,650, Cl. 423-19.000.

Gyugyi, Laszlo; Stacey, Eric J.; and Strycula, Eugene C., to Westinghouse Electric Corporation. Electrical power system. 3,825,815, Cl. 321-9.00a.

H-C Industries, Inc.: *See*—
Lidikay, Lyle M.; and Wilde, Sheldon L., 3,825,044.

Haas, Hans: *See*—
Mietens, Gerhard; Kohler, Gerd; Haas, Hans; and Roszinski, Hilmar, 3,825,628.

Habdas, Edward P.: *See*—
Herren, James L.; and Habdas, Edward P., 3,825,873.

Habegger, Richard; and Dombrowski, Frank R., to General Electric Company. Apparatus and method for use in coil tying. 3,824,940, Cl. 112-121.200.

Hadady Machining Co., Inc.: *See*—
Lanman, Robert W., 3,825,363.

Haeberle, Heinz H.; and Husted, John M., to Communications Statellite Corporation. Expansion/compression and elastic buffer combination. 3,825,899, Cl. 340-172.500.

Hagar, James L.; and Schwartz, Harold E., Jr., to Mobil Oil Corporation. Automatic data retrieval system for pumping wells. 3,824,851, Cl. 73-151.000.

Hagemann, Guy; and Clemence, Francois, to Roussel Uclaf. Method for treating bacterial toxins. 3,825,664, Cl. 424-316.000.

Hager, George S.: *See*—
Yablonski, Robert E.; Hager, George S.; and Campbell, William G., Jr., 3,824,870.

Hahn, Inc.: *See*—
Sorenson, Charles E.; Stubblefield, Clyde D.; Debaillie, Arnold A.; Bramley, Robert K.; and Bourassa, Hugh A., 3,824,772.

Hahn, Johann, to Suddeutsche Kuklerfabrik Julius Fr. Behr. Vacuum control drive. 3,824,903, Cl. 92-48.000.

Haisch, Richard A., to Esso Research and Engineering Company. Tank gauging system. 3,825,040, Cl. 141-1.000.

Hajos, Zoltan George; and Oliveto, Eugene Paul, to Hoffmann-La Roche Inc. Synthesis of tricyclic carbocyclic compounds and intermediates therefor. 3,825,569, Cl. 260-340.900.

Halaunbrenner, Lazare Nathan. Spat collector. 3,824,957, Cl. 119-4.000.

Halbich, Frank; and Needleman, Stuart W. Plastic case for glasses. 3,825,110, Cl. 206-6.000.

Haley, Paul H.; and Enns, Mark K., to Westinghouse Electric Corporation. Hybrid power system modules. 3,825,732, Cl. 235-151.210.

Halila, Ely E.; and Sterman, Albert P., to General Electric Company. Porous abradable turbine shroud. 3,825,364, Cl. 415-116.000.

Hall, Robert N., to General Electric Company. Gamma ray detector with channel limiting means. 3,825,759, Cl. 250-370.000.

Hall, Russell J. Pressure type dish washer. 3,825,019, Cl. 134-117.000.

Hall, Wayne C.; deceased (Hall, Wayne C., Jr.; and Allen, Scott D.; executor). Pipe cleaning apparatus. 3,824,738, Cl. 51-9.000.

Hall, Wayne C., Jr.: *See*—
Hall, Wayne C., 3,824,738.

Halliday, Robert G.: *See*—
Moon, Francis A.; and Halliday, Robert G., 3,825,185.

Halma, Pieter: *See*—
Bello, Wolfert; van der Muelen, Wijbren; and Halma, Pieter, 3,825,386.

Halpin, Robert G.: *See*—
Farfaglia, Silvio T.; and Halpin, Robert G., 3,825,408.

Hamel, Harvey C.; Kunzinger, Charles A.; and Stelzenmuller, William K., to International Business Machines Corporation. Superconductive shift register utilizing Josephson tunnelling devices. 3,825,906, Cl. 340-173.100.

Hammann, Ingeborg: *See*—
Hoffmann, Hellmut; Behrenz, Wolfgang; and Hammann, Ingeborg, 3,825,557.

Hammett & Edison: *See*—
Hammett, Robert L.; Todd, Ronald H.; and Templeton, Lawrence W., 3,825,835.

Hammett, Robert L.; Todd, Ronald H.; and Templeton, Lawrence W., to Hammett & Edison. Signal-to-noise ratio measurement. 3,825,835, Cl. 325-363.000.

Hammond Corporation: *See*—
Schrecongost, Ray B., 3,825,667.

Hampel, Daniel, to RCA Corporation. Multi-function logic gate. 3,825,770, Cl. 307-203.000.

Hanada, Hiroshi: *See*—
Inoue, Eiichi; Tsujiuchi, Junpei; Kokado, Hiroshi; Yamaguchi, Takashi; Shimizu, Isamu; Sakuma, Hiraku; Hanada, Hiroshi; and Tokunaga, Yukio, 3,825,317.

Hand, David R.: *See*—
Crane, James W.; and Hand, David R., 3,824,981.

Hanner, Glen P.: *See*—
Wadley, Edward F.; Wesselhoft, Robert D.; and Hanner, Glen P., 3,825,611.

Hannon, Charles N. Apparatus for forming treaded closures. 3,824,941, Cl. 113-1.00d.

Hanselmann, Dieter; and Prohaska, Hans, to SWF-Specialfabrik fur Autozubehor Gustav Rau GmbH. Switching device for indicating the loading of a vehicle seat. 3,825,707, Cl. 200-85.00a.

Hansen, Kenneth N., to Allis-Chalmers Corporation. Adjustable link with locking wrench for a tractor three-point hitch. 3,825,283, Cl. 280-461.00a.

Hansgen, Klaus; Ridder, Gerhard; and Schuhmann, Bernd, to Mannesmann-Meer Aktiengesellschaft. Actuator for multiple action remote control of a ships drive system. 3,824,879, Cl. 74-878.000.

Harada, Hiroshi: *See*—
Honma, Takamichi; Igarashi, Shigeru; and Harada, Hiroshi, 3,825,691.

Harada, Kazuhiko: *See*—
Izawa, Shinichi; Harada, Kazuhiko; Mizushiro, Ken; Ishihara, Miyoko; and Nakanishi, Atsuo, 3,825,521.

Hardin, George T., to Robertshaw Controls Company. Time schedule controller and parts and housing therefor. 3,824,860, Cl. 73-431.000.

Harding, John W.; Keller, James P.; and Buntin, Robert R., to Esso Research and Engineering Company. Melt-blowing die for producing nonwoven mats. 3,825,380, Cl. 425-72.000.

Harhaus, Volker W., to General Motors Corporation. Cylinder head oil drain system. 3,824,973, Cl. 123-119.00b.

Harmsen, Ernst: *See*—
Preisler, Eberhard; Grapentin, Kurt; Harmsen, Ernst; and Harnisch, Heinz, 3,825,652.

Harnisch, Heinz: *See*—
Preisler, Eberhard; Grapentin, Kurt; Harmsen, Ernst; and Harnisch, Heinz, 3,825,652.

Harris, Lawson P., to General Electric Company. Vacuum arc devices with hard, ductile, ferrous electrodes. 3,825,789, Cl. 200-144.00b.

Harris, Lennard D.: *See*—
McManus, Walter K.; Bouffard, Joseph T.; and Harris, Lennard D., 3,825,047.

Harris, Rano J., Jr.: *See*—
Harris, Rano J., Sr.; and Harris, Rano J., Jr., 3,824,859.

Harris, Rano J., Sr.; and Harris, Rano J., Jr. Automatic fluid injector. 3,824,859, Cl. 73-422.0gc.

Harris, Ronald E.; and Cullen, Darrel F., to North American Rockwell Corporation. Process for laser scribing beam lead semiconductor wafers. 3,824,678, Cl. 29-578.000.

Harris-Intertype Corporation: *See*—
Elia, Frederick J.; Brothers, Donald C.; Hofschild, Clewell; and Bryson, Robert A., 3,825,246.
Fernandez-Rana; and Mebus, Henry R., 3,825,247.

Harrison, Maurice Clark; and Vancil, Donald Otis, to Reynolds Metals Company. Method of preparing sodium-aluminum fluoride. 3,825,659, Cl. 423-465.000.

Hart, Joel C.; and Traughber, Charles W., Jr., to British-American Tobacco Co., Ltd. and Fishburne International, Inc. Method and apparatus for packing compressible material such as tobacco. 3,824,758, Cl. 53-24.000.

Hartl, Gerhard, to Semperit Aktiengesellschaft. Level crossing structures. 3,825,184, Cl. 238-8.000.

Hartley, Danny L.; and Hill, Ronald A., to United States of America, Atomic Energy Commission. Light trap. 3,825,325, Cl. 350-294.000.

Hartmann, John E.; LaCamera, Alfred F.; and Lake, Peter B., to Youngstown Sheet and Tube Company. Production of ductile high strength galvanized steel. 3,825,448, Cl. 148-12.100.

Hartnell, William John. Rapid lay building bricks. 3,824,755, Cl. 52-314.000.

Haseltine, Marcus W., Jr.: *See*—
Newingham, Thomas D.; Recchuite, Alexander D.; Griffith, John O., III; and Haseltine, Marcus W., Jr., 3,825,495.

Hasimoto, Dojun: *See*—
Farrell, Greg; Tsuji, Akira; Hasimoto, Dojun; Koto, Nobuhisa; and Hirai, Nobutake, 3,825,679.

Hatachi Electronics Co., Ltd.: *See*—
Seki, Takeo; Kawamura, Shigenori; Maeda, Itsuji; and Kaneko, Akira, 3,825,351.

Hattori, Masaichi: *See*—
Maeda, Tsuneo; and Hattori, Masaichi, 3,825,797.

Haugwitz, Rudiger D.; and Narayanan, Venkatachala Lakshmi, to Squibb, E. R., & Sons, Inc. 1-Thiazolin-2-yl(or thiazin-2-yl)-2-aminobenzimidazoles and derivatives thereof. 3,825,537, Cl. 260-243.00r.

Hauke, Rudolf: *See*—
Einighammer, Hans J.; and Hauke, Rudolf, 3,825,786.

Hauni-Werke Koerber & Co. KG.: *See*—
David, Harry; and Rudszinat, Willy, 3,825,152.

Hay, Isaac K., Jr.: *See*—
Schumaker, Aaron C.; and Hay, Isaac K., Jr., 3,825,112.

Hayami, Heijiro: *See*—
Tsuchiya, Hiroyoshi; Tsuda, Yukifumi; Hayami, Heijiro; and Kotera, Hiroaki, 3,825,678.

Hayami, Tadao, to Kabushiki Kaisha Koparu. Focal plane shutter. 3,825,940, Cl. 354-241.000.

Hayasaka, Yoshiyuki: *See*—
Hayase, Masao; Hayasaka, Yoshiyuki; and Araki, Yozo, 3,825,750.

Hayase, Masao; Hayasaka, Yoshiyuki; and Araki, Yozo, to Mitsubishi Jukogyo Kabushiki Kaisha. Method and apparatus for detecting defective seals on bag-shaped articles. 3,825,750, Cl. 250-223.00r.

Hayashi, Hideo: *See*—
Hirai, Kakichi; Hayashi, Hideo; and Hiratsuka, Yoichi, 3,825,624.

Hayes-Albion Corporation: *See*—
Albertzart, R. Richard, 3,825,369.

Hayner, Paul F., to Sanders Associates, Inc. Extended range valve system. 3,825,033, Cl. 137-625.660.

Hayward, H. Dutton, trustee of the Hilda Trusts: *See*—
Kortman, Joe M., 3,825,935.

Heath, George E., to Infra-Ray Division Solaronics, Inc. Radiation-convection heating system. 3,825,406, Cl. 432-175.000.

Hecht, Jay R. Engine cooling fan spacer structure. 3,824,807, Cl. 64-6.000.

Heckle, Manfred. Method and apparatus for measuring the flow rate of fluids such as gases or liquids. 3,824,855, Cl. 73-194.00b.

Heenan, Richard H.; and Litsinger, George M., to Coca-Cola Company, The. Irrigation riser base system. 3,825,186, Cl. 239-280.000.

Hegler, Wilhelm. Apparatus for cutting apertures in tubes. 3,824,886, Cl. 83-329.000.

Hehl, Karl. Hydraulic drive means for the mold closing unit of an injection molding or die casting machine. 3,825,384, Cl. 425-137.000.

Heilhecker, Joe K.; Wood, Donald B.; and Heintz, Karl O., to Esso Production Research Company. Method of mounting and maintaining an electric conductor in a drill string. 3,825,078, Cl. 175-57.000.

Heilhecker, Joe K., to Esso Production Company. Method for mounting an electric conductor in a drill string. 3,825,079, Cl. 175-57.000.

Heilmann, Fery; and Edel, Peter, to Institut fur Textilmaschinen. Warp knitting machine. 3,824,811, Cl. 66-84.000.

Heilmann, Max, to Agfa-Gevaert Aktiengeselischaft. Process for the regeneration of used photographic silver bleaching baths using chlorous acid or its water-soluble salts. 3,825,425, Cl. 96-60.00r.

Heilmayr, Peter F.; and Kimbrell, Sol B., to Certain-Teed Products Corporation. Apparatus for extruding, embossing, and curving siding. 3,825,390, Cl. 425-325.000.

Heinen, Harold J.; Eisele, Judith A.; and Fischer, Dennis D., to United States of America, Interior. Recovery of gold from ores. 3,825,651, Cl. 423-44.000.

Heinrich, Frank-Armin; and Kiefer, Hans-Friedrich, to Bosch, Robert, Photokino GmbH. Motion picture camera having means for simultaneously selecting the film speed and the corresponding aperture size. 3,825,329, Cl. 352-141.000.

Heins, Pierre: *See*—
Basset, Jean-Claude; and Heins, Pierre, 3,825,855.

Heintz, Karl O.: *See*—
Heilhecker, Joe K.; Wood, Donald B.; and Heintz, Karl O., 3,825,078.

Heiple, Kingsbury G.: *See*—
Burstein, Albert H.; and Heiple, Kingsbury G., 3,824,631.

Heller, Laszlo; Forgo, Laszlo; and Horvath, Mihaly, to Transelektro Magyar Villamossagi Kulkereskedelmi Vallalat. System for filling and emptying of heat exchangers. 3,825,060, Cl. 165-11.000.

Heller, Laszlo; Forgo, Laszlo; and Bodas, Janos, to Transelektro Magyar Villamossagi Kulkereskedelmi Vallalat. Breathers for liquid operated heat exchangers. 3,825,062, Cl. 165-111.000.

Helmschrott, Norbert, to Kienzle Apparate GmbH. Servomechanism, particularly a vehicle speedometer or trip-recorder. 3,825,810, Cl. 318-618.000.

Hemfort, Heinz, Jr.: *See*—
Kohlstette, Werner; and Hemfort, Heinz, Jr., 3,825,177.

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Hemmer, Valentine J., to Bendix Corporation, The. Coaxial cable contact. 3,825,883, Cl. 339-177.00r.

Hendel, Robert J.; Jamba, Theodore F., Jr.; Keefe, George E.; and Rosier, Laurence L., to International Business Machines Corporation. Magnetic bubble domain system having improved operating margins. 3,825,885, Cl. 340-174.0tf.

Hendershot, William B., III; Wald, David; and Whitlock, Larry K., to Consolidated Video Systems, Inc. High speed thermal duplication of magnetic tape. 3,825,948, Cl. 360-16.000.

Henderson, Eulas W., to Phillips Petroleum Company. Carbon black pelleter. 3,825,233, Cl. 259-182.000.

Henderson, Jack A. Automatic multiple fuel tank control valve. 3,825,027, Cl. 137-265.000.

Hendrick, Fred W.: *See*—
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Henrick, Clive A.: *See*—
Descoins, Charles E.; and Henrick, Clive A., 3,825,607.

Henry, Calvin Scott, III, to Winery Systems, Inc. Piping connector. 3,825,286, Cl. 285-93.000.

Hensen, Karl A.; and Lunden, Clarence D., to Boeing Company, The. Dynamic proof loading of metal bond structures using pulsed magnetic fields. 3,825,819, Cl. 324-34.00r.

Herbert, Gary N.: *See*—
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Herman, David; and Friedman, Sidney J., to Coffee-Mat Corporation. Apparatus for cleaning brew head screen. 3,824,913, Cl. 99-29.800.

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Herrmann, Walter, to Bosch, Robert, G.m.b.H. Convertible directional control valve. 3,825,028, Cl. 137-270.000.

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Hervert, George L., to Universal Oil Products Company. Method for starting up an alkylation system. 3,825,617, Cl. 260-638.480.

Herzig, Albert M. Automatic closure for containers. 3,825,157, Cl. 222-212.000.

Hess, Walter F.: *See*—
Donahue, Jerome T.; Hess, Walter F.; Knoebel, Gordon W.; and Sydow, Donald E., 3,824,658.

Hesse, Kurt. Adapter for current distributor rail. 3,825,879, Cl. 339-21.00r.

Hesser, Henry G.: *See*—
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Hetherington, Sidney W. Humidifier. 3,824,985, Cl. 126-113.000.

Hetzler, Lewis R.: *See*—
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Hilfman, Lee, to Universal Oil Products Company. Hydrocarbon hydroprocessing catalyst. 3,825,504, Cl. 252-464.000.

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Hill, Ronald A.: *See*—
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Hillier, Edward Francis Herbert Benjamin; and Holmes, Anthony Roger, to Dowty Seals Limited. Production of shaped articles. 3,825,643, Cl. 264-161.000.

Hills, Marvin S. Snap hook. 3,824,655, Cl. 24-237.000.

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Hines, James W.: *See*—
Drury, Raymond L., Jr.; Hines, James W.; and Nevin, Charles S., 3,825,514.

Hinley, John James; and Gibson, John, to British Titan Limited. Apparatus for the treatment of pigments. 3,825,388, Cl. 425-222.000.

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Hirai, Nobutake: *See*—
Farrell, Greg; Tsuji, Akira; Hasimoto, Dojun; Koto, Nobuhisa; and Hirai, Nobutake, 3,825,679.

Hirakawa, Hayao: *See*—
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Hirmann, Georg, to Koenig, Dr. Ing., AG. Method for closing bores at workpieces and improved plug constructions for the preformance of the aforesaid method. 3,825,146, Cl. 220-24.500.

Hirsch, A. Adler. Sampler-culture apparatus for the detection of coliform bacteria in potable waters. 3,825,476, Cl. 195-127.000.

Hisada, Eiichi: *See*—
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Hoagland, John M.; Tokos, George M.; and Tonn, Edward G. Apparatus for producing multilaminated film. 3,825,383, Cl. 425-131.000.

Hoagland, John M.; Tokos, George M.; and Tonn, Edward G., to Crown Zellerbach Corporation. Process for producing multilaminate film. 3,825,644, Cl. 264-171.000.

Hoch, Winton C. Optical system for a stereoscopic motion picture camera. 3,825,328, Cl. 352-60.000.

Hockham, George Alfred, to International Standard Electric Corporation. Waveguide antenna. 3,825,932, Cl. 343-776.000.

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Hofer, Kurt; and Tscheulin, Guenther, to Sandoz Ltd. Benzene phosphonates. 3,825,629, Cl. 260-932.000.

Hofer, Wolfgang; Schliebs, Reinhard; Schmidt, Robert; and Eue, Ludwig, to Bayer Aktiengesellschaft. 2-Chloroethane-(thiono)-posphonic acid amido esters. 3,825,635, Cl. 260-959.000.

Hoff, Melvern C.: *See—*
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Hoffmann, Hellmut; Behrenz, Wolfgang; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. O-(1-Substitutes-3-methyl-4-chloro-pyrazolo) thionophosphoric (phosphonic) acid esters. 3,825,557, Cl. 260-310.00r.

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Holland, Andrew M.; and Pester, William B., to Mattel, Inc. Selectable play mechanism for stationary record. 3,825,268, Cl. 274-9.00c.

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Hollins, Jesse R. Vehicle internal combustion engine lubricating oil cooling and filtering circulation system. 3,824,980, Cl. 123-196.0ab.

Holmes, Anthony Roger: *See—*
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Honeywell Inc.: *See—*
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Honeywell Information Systems Inc.: *See—*
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Hong, Se J.: *See—*
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Honkaranta, Reijo; Jarvenpaa, Kauko; and Shephard, Kevin, to Suunto Oy. Compass device for sailing. 3,824,947, Cl. 116-114.00r.

Honma, Takamichi; Igarashi, Shigeru; and Harada, Hiroshi, to Nippon Electric Company, Limited. F-T rada receiver with level discrimination. 3,825,691, Cl. 179-15.0ba.

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Horneff, James P.; and Pelosi, Michael H., Jr., to CGT Corp. Distribution system for clean rooms. 3,824,909, Cl. 98-40.00c.

Horner, Tommy Dean; and Wing, Charles E., Jr. Animal heat or estrus detector. 3,824,989, Cl. 128-2.00h.

Horrigan, Frank A.: *See—*
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Howard, Donald W.: *See—*
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Howard, Durrell U. Trailer coupling means. 3,825,281, Cl. 280-423.00r.

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Howorth, Frederick Hugh, to Howorth Air Conditioning Limited. Operating theatres. 3,824,987, Cl. 128-1.00r.

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Hoyt, Donald L., to Texaco Inc. Gradient barrier in a secondary recovery operation to inhibit water coning. 3,825,070, Cl. 166-306.000.

Hsiao, Mu-Yue: *See—*
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Hubbard, Leo J. Feed mechanism. 3,825,162, Cl. 226-74.000.

Hubby, Laurence M., to Texaco Inc. Offshore marine anchoring structure. 3,824,794, Cl. 61-46.000.

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Hudson, Colin M., to United States of America, Army. Mini-caliber firearm for launching hypervelocity projectiles. 3,824,727, Cl. 42-1.00j.

Huebner, H. Douglas, to Newport News Shipbuilding & Dry Dock Company. Method of transferring electrical data signals from moving bodies. 3,824,845, Cl. 73-88.50r.

Huggins, James A., to Baxter Laboratories, Inc. Disposable humidifier. 3,825,000, Cl. 128-194.000.

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Hujii, Tooru: *See—*
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Hunnicutt, Clyde J., Jr. 5 Ventilating attachment for water closet. 3,824,637, Cl. 4-213.000.

Hunt, Howard D., to Crown Crafts, Inc. Flocking method utilizing in line mixing of adhesive. 3,825,435, Cl. 117-33.000.

Hunter, Richard F.; and Truitt, Robert B., to General Electric Company. Hermetic sealing system for plastic tank and cover. 3,825,148, Cl. 220-46.00r.

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Hussmann, Jurgen; and Kurth, Dieter, to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H. Machine for the preparation and extrusion of plastics. 3,825,236, Cl. 259-191.000.

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Hutchins, Alma A. Piercing of air suction holes in abrasive sheet material. 3,824,689, Cl. 30-368.000.

Hutchins, Alma A. Suction system for abrading tool. 3,824,745, Cl. 51-170.00t.

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Inoue, Kiyoshi. Heat exchanger. 3,825,064, Cl. 165-179.000.
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Miura, Takashi; Sugiura, Takashi; and Iyoda, Yoshizi, 3,825,058.
Izawa, Shinichi; Harada, Kazuhiko; Mizushiro, Ken; Ishihara, Miyoko; and Nakanishi, Atsuo, to Asahi-Dow Limited. Manganese-amine chelate catalyzed aromatic polyether formation. 3,825,521, Cl. 260-47.0et.
Jablonsky, Erich, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Steering mechanism. 3,824,905, Cl. 92-136.000.
Jackson Communication Corporation: *See—*
Jackson, Richard L., 3,824,835.
Jackson, George Robert. Method for anchoring a drilling rig in permafrost. 3,825,077, Cl. 175-57.000.
Jackson, Richard L., to Jackson Communication Corporation. Cable bender. 3,824,835, Cl. 72-389.000.
Jackson, Wilbur F.: *See—*
Jess, Thurman S.; and Jackson, Wilbur F., 3,825,868.
Jacobs, David R.: *See—*
Spancl, Abram N.; and Jacobs, David R., 3,824,939.
Jacobs, F. L., Co.: *See—*
Blake, Jack W., 3,825,314.
Jacobs, Melvin A., to GTE Automatic Electric Laboratories, Incorporated. Arrangement and method for detecting faults in a switching network. 3,825,701, Cl. 179-175.230.
Jacobs, Norman H.; and Susor, William C., to Reliance Electric Company. Monitor for moving vehicles. 3,825,734, Cl. 235-151.330.
Jacquart, Christian A., to IBM Corporation. Switchable current generator. 3,825,776, Cl. 307-270.000.
Jaeger, Horst, to Ciba-Geigy AG. Perfluoroalkylalkylmonocarboxylic acid esters. 3,825,575, Cl. 260-408.000.
Jaeger, Wilbert J. Fluid dispensing system. 3,825,154, Cl. 222-136.000.
Jaggers, H. Dane, to Lectrasearch Corporation. Apparatus for transmitting the output of a musical instrument for amplification. 3,825,666, Cl. 84-1.010.

Jai, Marlyse Janean Baldwin. Combination drilling and brushing tool in a pipe cleaning machine. 3,824,646, Cl. 15-104.10r.

Jamba, Theodore F., Jr.: *See—*
Hendel, Robert J.; Jamba, Theodore F., Jr.; Keefe, George E.; and Rosier, Laurence L., 3,825,885.

Janelid, Ingvar: *See—*
Janelid, Ingvar; and Bergdahl, Sven Gunnar (said Bergdahl assors to said), 3,824,911.

Janelid, Ingvar; and Bergdahl, Sven Gunnar, said Bergdahl assors to said Janelid, Ingvar. Ventilation of a tunnel, mine adit or the like. 3,824,911, Cl. 98-50.000.

Janson, David Wenzel Alexander, to ESAB-Hebe Aktiebolag. An apparatus for grit balsting the edge of a plate like member. 3,824,737, Cl. 51-8.000.

Japan Gasoline Co., Ltd: *See—*
Ohtsu, Takawo; Nakamura, Yukinobu; and Sekido, Fujihiko, 3,824,838.

Jaquiss, Donald B. G., to General Electric Company. Process for recovering 2,2,4-trimethyl-4-(4-hydroxyphenyl) chroman. 3,825,562, Cl. 260-235.200.

Jarvenpaa, Kauko: *See—*
Honkaranta, Reijo; Jarvenpaa, Kauko; and Shephard, Kevin, 3,824,947.

Jasper Electronics Manufacturing Company: *See—*
Welsh, Alan B., 3,825,775.

Jaw-Bar Plastics Corporation: *See—*
Lind, Willard E., 3,824,933.

Jenkins, Thomas E., to General Electric Company. Dishwasher assembly. 3,825,373, Cl. 417-360.000.

Jenniges, Ernst, to Chemiebau Dr. A. Zieren G.m.b.H., & Co., K.G. Process for the cracking of sulfuric acid. 3,825,657, Cl. 423-540.000.

Jensen, Frederick K.; and Jewell, Gordon W., to Elektro-Ion, Inc. Powder spray booth. 3,824,912, Cl. 98-115.50b.

Jensen, Winton D.: *See—*
Whitehill, Rex G.; Berchenbriter, Gerald D.; and Jensen, Winton D., 3,825,227.

Jerry, Albert; and Baum, Jasper, to Sonotone Corporation, mesne. Articulated hearing aid temple and behind-the-ear hearing aid element. 3,825,700, Cl. 179-107.00s.

Jess, Thurman S.; and Jackson, Wilbur F., to Robertshaw Controls Company. Thermally responsive switch. 3,825,868, Cl. 337-112.000.

Jeuken, Josef; Vieregge, Gustav; and Meyer, Konrad, to Rheinstahl AG. Ring rolling mill. 3,824,820, Cl. 72-10.000.

Jewell, Gordon W.: *See—*
Jensen, Frederick K.; and Jewell, Gordon W., 3,824,912.

Joco, Incorporated: *See—*
Foxhall, Ollie C., 3,824,849.

Johansson, Sture Ragnar; and Carlsson, Hilding Ake Gerry, to Monark-Crescent AB. Control and security device for burners. 3,825,397, Cl. 431-79.000.

Johnson & Johnson: *See—*
Bennet, Stanford M.; Smith, William; and Thomas, Joseph J., 3,825,001.

Johnson, Allen M., Jr., to International Business Machines Corporation. Self-checking parity checker for two or more independent parity coded data paths. 3,825,894, Cl. 340-146.1ag.

Johnson, Claiborne H., Jr.; and Foote, Robert S., to Texas Instruments, Incorporated. Method and apparatus for aerial radioactivity surveying for surface mineral deposits which compensates for the radioactive decay products in the atmosphere of the earth. ,825,751, Cl. 250-253.000.

Johnson, Earl E.: *See—*
Zettler, William D.; and Johnson, Earl E., 3,824,890.

Johnson, Lewis T.; and Bull, Willard E., to Phillips Petroleum Company. Nest and stack container. 3,825,114, Cl. 206-507.000.

Johnson, Peter D., to United States of America, Atomic Energy Commission. Fueled moderator composition. 3,825,499, Cl. 252-301.10r.

Johnson, Robert L. Fishing rod holder. 3,824,730, Cl. 43-17.000.

Johnson, S. C., & Son, Inc.: *See—*
Lajiness, Thomas A., 3,825,555.

Johnson, Victor P.: *See—*
Evnas, John L.; De Cotiis, C. John; and Johnson, Victor P., 3,824,865.

Johnston, Byron E., to Mobil Oil Corporation. Oxidation of isoparaffins to tertiary alcohols. 3,825,605, Cl. 260-632.00c.

Johnston, Daniel H.; Mannheimer, Rudy; Rinkleib, Helfried O.; Walker, Ivan D.; and Kellner, John R., to International Business Machines Corporation. Cartridge and storage apparatus. 3,825,208, Cl. 242-197.000.

Johnston, L. Lyle, to Zimmer Manufacturing Co. Prosthetic joint for total knee replacement. 3,824,630, Cl. 3-1.000.

Johnston, Philip Douglas; Lawton, James; and Mackison, Ian, to Electricity Council, The. Method and apparatus for the production of liquid titanium from the reaction of vaporized titanium tetrachloride and a reducing metal. 3,825,415, Cl. 75-84.500.

Jonsson, Sven Jonas Roland, to Elektriska Svetsningsaktiebolaget. Contact nozzle for a continuous arc welding electrode. 3,825,719, Cl. 219-130.000.

Julian, Randall K., to Sunbeam Plastics Corporation. Childproof medicine vial. 3,825,143, Cl. 215-9.000.

Junghans, Gebruder, G.m.b.H., Firma: *See—*
Kaiser, Paul; Kaiser, Hans; and Muller, Josef, 3,824,889.

Justice, James W. H., to Westinghouse Electric Corporation. Educational TV branching system. 3,825,674, Cl. 178-5.600.

Kabushiki Kaisha Hattori Tokeiten: *See—*
Miyazato, Takanori; Nakayama, Keiichi; and Fujii, Masao, 3,825,890.

Kabushiki Kaisha Koparu: *See—*
Hayami, Tadao, 3,825,940.
Murata, Kingo; and Wakabayashi, Kaoru, 3,825,702.

Kabushiki Kaisha Sankyo Seiki Seisakusho: *See—*
Kobayashi, Hiromasa; Oguchi, Yuzo; and Nakata, Kazuhiko, 3,825,950.

Kabushiki Kaisha Sayama Seikakusho: *See—*
Takahashi, Toshinao, 3,825,120.

Kabushiki Kaisha Sega Enterprises: *See—*
Ochi, Shikanosuke, 3,825,256.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See—*
Maeda, Tsuneo; and Hattori, Masaichi, 3,825,797.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Mizutani, Yoshiyuki; and Tozawa, Katutoshi, 3,825,416.

Kaczkowski, Bernard Ceasar: *See—*
Baumann, Frederick William; Kaczkowski, Bernard Ceasar; Rosenberry, George Mowry, Jr.; and Smith, William R., 3,825,057.

Kafak Aktiebolag: *See—*
Bergman, Kurt Tage Lennart, 3,825,708.

Kageyama, Hiroo: *See—*
Tazuke, Hideo; Kitahara, Toshio; and Kageyama, Hiroo, 3,825,559.

Kaiser Aluminum & Chemcal Corporation: *See—*
Gibbs, Francis E., 3,825,712.

Kaiser, Hans: *See—*
Kaiser, Paul; Kaiser, Hans; and Muller, Josef, 3,824,889.

Kaiser, Nils, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Apparatus for determining a substance by an optical radiation. 3,825,347, Cl. 356-107.000.

Kaiser, Paul; Kaiser, Hans; and Muller, Josef, to Junghans, Gebruder, G.m.b.H., Firma. Time fuze adjustment. 3,824,889, Cl. 89-6.000.

Kalsi, Manmohan S., to ACF Industries, Incorporated. Lined valves. 3,825,030, Cl. 137-375.000.

Kaltenbock, Karl, to Semperit Aktiengesellschaft. Floor structure. 3,824,960, Cl. 119-28.000.

Kamijo, Hirotaka: *See—*
Kubota, Koji; Yoshihara, Yasuhiko; Hirakawa, Hayao; Kamijo, Hirotaka; Nosaki, Shigeki; Yoshinaga, Fumihiro; Okumura, Shinji; and Okada, Hiroshi, 3,825,472.

Kamosawa, Katsuya: *See—*
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Kanai, Fumio: *See—*
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Kandler, Joachim: *See—*
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Kaneko, Akira: *See—*
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Kanisawa, Hideo: *See—*
Furuya, Tetsuo; Ibe, Yoshio; Kanisawa, Hideo; and Sugino, Osakazu, 3,825,429.

Karlskronavarvet AB: *See—*
Ramstrom, Sven, 3,825,864.

Karmas, George, to Ortho Pharmaceutical Corporation. Alkyl esters of 2-(lower alkyl)-3-(lower alkyl) —4-aryl-3- or 4-cyclohexenecarbinols 6 260/410.500. 3,825,576, Cl. .

Karpis, John J.: *See—*
Darges, Walter; Karpis, John J.; Petitgout, George L.; and Witbeck, Walter G., 3,825,212.

Kasano, Hiroyuki, to Hitachi, Ltd. Optical semiconductor device and method of manufacturing the same. 3,825,806, Cl. 317-234.00r.

Kasprzak, Vincent D., to Arvin Industries, Inc. Television scan converter bandwidth reduction device. 3,825,677, Cl. 178-6.800.

Kasselmann, John T.; Hickner, George B.; Howard, Donald W.; and Needham, James M., to Bendix Corporation, The. Adaptive braking system. 3,825,305, Cl. 303-21.0be.

Kasselmann, John T.; and Goran, Michael B., to Bendix Corporation, The. Proportioning valve control means. 3,825,308, Cl. 303-21.00a.

Katchka, Jay R.; Hendrick, Fred W.; and Egger, Michael E., to Robertshaw Controls Company. Plural rate burner with flame enhancement. 3,825,398, Cl. 431-80.000.

Kato, Hiroyuki; Tsuzi, Isao; Azuma, Kishiro; and Tatemichi, Hidemaro, to Toagosei Chemical Industry Co., Ltd. Heat-resistant adhesive compositions containing radical polymerizable alpha-cyanoacrylates. 3,825,580, Cl. 260-465.400.

Katsumata, Mitsuo; Miyamoto, Mitsunori; and Shirai, Kiyoshi, to Kokusan Denki Co., Ltd. Capacitor charge-discharge type ignition system for use in a two-cycle internal combustion engine. 3,824,976, Cl. 123-148.00e.

Katz, Carlos; Garcia, Felipe; and Allam, Elsayed, to United States of America, Interior. Connector for use in capacitive graded splices. 3,825,670, Cl. 174-73.00r.

Kauffman, John H., to National Engineering Company. Apparatus for teating granular material. 3,825,190, Cl. 241-40.000.

Kawagoe, Hiroto, to Hitachi, Ltd. Decoder circuit. 3,825,888, Cl. 340-347.0dd.

Kawahara, Takeji; and Terumoto, Masahiro, to Itami Keiran Kako Kabushiki Kaisha. Sterilization and/or cooking apparatus. 3,824,917, Cl. 99-404.000.
Kawamura, Shigenori: *See—*
Seki, Takeo; Kawamura, Shigenori; Maeda, Itsuji; and Kaneko, Akira, 3,825,351.
Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Tajika, Kazuya; and Shimizu, Hidenori, 3,824,979.
Kazan, Benjamin, to International Business Machines Corporation. Field-effect storage tube. 3,825,791, Cl. 313-398.000.
Kearney & Trecker Corporation: *See—*
Osburn, John G.; and Schachte, John J., 3,825,245.
Keblys, Kestutis A., to Ethyl Corporation. Stabilized halogenated hydrocarbons. 3,825,608, Cl. 260-652.500.
Keefe, George E.: *See—*
Hendel, Robert J.; Jamba, Theodore F., Jr.; Keefe, George E.; and Rosier, Laurence L., 3,825,885.
Keil, Alfred A. H.; and Vetter, Michael F., to Massachusetts Institute of Technology. Reinforced structural medium. 3,824,944, Cl. 114-69.000.
Keim, Norbert: *See—*
Deck, Fritz; and Keim, Norbert, 3,824,647.
Kelemen, Jozsef W.: *See—*
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Kelleher, John M.: *See—*
McArthur, Ralph F.; Geurts, Melle F.; and Kelleher, John M., 3,825,285.
Kellenbenz, Rolf: *See—*
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Kellenberger, Stanley R.: *See—*
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Keller, James P.: *See—*
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Lohkamp, Dwight T.; and Keller, James P., 3,825,379.
Kellner, John R.: *See—*
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Kellwood Company: *See—*
Matthews, Robert M.; and Petty, Albert W., 3,824,812.
Kelly, Ian William: *See—*
Macardy, Douglas; and Kelly, Ian William, 3,824,946.
Kelly, Michael J.; Kobylar, Alex W.; and Rekiere, Bernard J., to GTE Automatic Electric Laboratories Incorporated. Lossless network junctor for PCM digital switching systems. 3,825,690, Cl. 179-15.0at.
Kelman, Naomi S.: *See—*
Scopa, Paul P.; and Kelman, Naomi S., 3,824,706.
Kempf, Donald F. Door bumper. 3,824,649, Cl. 16-86.00a.
Kendler, Hayden Brian; Ripley, Lionel George; and Woollons, David John, to National Research Development Corporation. Light pen. 3,825,746, Cl. 250-209.000.
Kennard, Jack Frederick: *See—*
Warman, Bloomfield James; Elliott, Kenneth Frederick; and Kennard, Jack Frederick, 3,825,800.
Kennard, Thomas J.; and Moseman, Lawrence E. Number guessing game device. 3,825,255, Cl. 273-1.00e.
Kennedy, John B., Jr.: *See—*
Rarey, Kenneth W.; and Kennedy, John B., Jr., 3,824,924.
Kennedy, Melvin R.: *See—*
Pitkanen, Alan R.; Kennedy, Melvin R.; Nagel, Dietmar; Gross, William J.; and Bosley, Denis V., 3,825,265.
Kennedy, Ralph C., to Colt Industries Operating Corp. (Firearms Division). Cross bolt safety for single action revolvers. 3,824,728, Cl. 42-66.000.
Kent-Moore Corporation: *See—*
Michelsen, Jacob, 3,824,672.
Ker, Robert Alan Cameron, to Castrol Limited. Hydraulic fluids. 3,825,497, Cl. 252-79.000.
Kern, Rene; Poulain, Claude; and Tock, Francois, to Societe Anonyme dite; Aquitaine Total Organico. Process for the preparation of omega laurinolactame. 3,825,532, Cl. 260-239.30a.
Kerr-McGee Corporation: *See—*
Chappelow, Cecil C., Jr.; and Engel, James F., 3,825,585.
Kessler, Gerald. Nailing clip for plastic siding. 3,824,756, Cl. 52-548.000.
Keyser, Lewis R., to Price Brothers Company. Jacking pipe. 3,825,037, Cl. 138-175.000.
Keystone Consolidated Industries, Inc.: *See—*
Orr, John L., 3,824,817.
Kiatipoff, Edmond, to Sauget, Andre and Fremand, Michel. Method of electronically controlling braking of a vehicle and an electronically controlled braking device for a vehicle. 3,825,304, Cl. 303-21.0be.
Kiefer, Hans-Friedrich: *See—*
Heinrich, Frank-Armin; and Kiefer, Hans-Friedrich, 3,825,329.
Kienzle Apparate GmbH: *See—*
Helmschrott, Norbert, 3,825,810.
Kies, Jared R., to Owens-Corning Fiberglas Corporation. Method for producing a film faced product. 3,825,642, Cl. 264-90.000.
Kihlstedt, Per Gudmar, to AB Cold-Bound Pellets. Method for producing cold bound agglomerated from particulate mineral concentrates. 3,825,638, Cl. 264-63.000.
Kikuchi, Akira; Agatsuma, Takashi; and Anzai, Akio, to Hitachi, Ltd. Method of forming interconnections. 3,825,454, Cl. 156-8.000.
Kilkeev, Renat Shakhimardanovich: *See—*
Nekrasov, Lev Borisovich; Misnik, Jury Mikhailovich; Tsukernik, Zolya Samuilovich; Kriger, Semen Davidovich; and Kilkeev, Renat Shakhimardanovich, 3,824,718.
Kimberly-Clark Corporation: *See—*
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Green, Angelica G., 3,824,625.
Kimbrell, Sol B.: *See—*
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Kimura, Akio: *See—*
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Okuno, Yositosi; Ogawa, Taizo; Wakatsuki, Toshiyuki; and Nishizawa, Yoshihiko, 3,825,633.
Kinast, Norbert, to Daimler-Benz Aktiengesellschaft. Brake-lining wear-indicator. 3,825,891, Cl. 340-52.00a.
King Instrument Corporation: *See—*
Gorman, Robert H., 3,825,461.
King, William R., to Sandoz-Wander, Inc. Tracheotomy mask. 3,824,999, Cl. 128-185.000.
Kingsley, William; and Allis, Robert F., to Xerox Corporation. Wrap adjust device for controlling engagement between a web and roller. 3,825,724, Cl. 219-469.000.
Kirchweger, Karl: *See—*
Skatsche, Othmar; Thien, Gerhard; and Kirchweger, Karl, 3,824,971.
Kirsch, Jerry. Method of making block manifold for fluids control systems. 3,825,647, Cl. 264-277.000.
Kishino, Shigeo; Kudamatsu, Akio; Takase, Iwao; Shiokawa, Kozo; and Yamaguchi, Shini-Ichi, to Bayer Aktiengesellschaft. O-ethyl S-propyl-dithiophosphoric acid phenyl or naphthyl esters. 3,825,636, Cl. 260-964.000.
Kitahara, Toshio: *See—*
Tazuke, Hideo; Kitahara, Toshio; and Kageyama, Hiroo, 3,825,559.
Kitson, George Samuel; and Sutton, Julian MacDonald Davison, to State for Defence, The Secretary of. Thrust deflectors for ducted fan gas turbine engines. 3,824,784, Cl. 60-226.00a.
Kiuchi, Yoshinori: *See—*
Nakamura, Kihei; Yamazaki, Harumichi; Masuda, Hirotsugu; Sato, Takeshi; and Kiuchi, Yoshinori, 3,825,292.
Kivistik, Olev, to General Electric Company. Interlocked push-pull driver circuit. 3,825,773, Cl. 307-255.000.
Kjos, Magne Jarle; and Molleman, Johan Henri, to Burroughs Corporation. Pneumatically controlled bistable reel hub mechanism. 3,825,203, Cl. 242-68.300.
Klein, Gerald I.; Moore, Robert A.; and Payer, Stephen F., to Westinghouse Electric Corporation. Minimum insertion loss yig pulse compression filter transducer. 3,825,859, Cl. 333-30.00m.
Kleinke, Bernard L.: *See—*
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Klemm, Ernst. Ski pole. 3,825,275, Cl. 280-11.37n.
Klemm, Kurt; and Langenscheid, Erhard, to BYK Gulden Lomberg Chemische Fabrik GmbH. Production of 2-butyl-N,N'-diphenyl-malonomono-hydrazide. 3,825,589, Cl. 260-518.00r.
Kliment, Karel: *See—*
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Kmecak, Ronald A.: *See—*
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Kmecak, Ronald A.; and Kovach, Stephen M., to Ashland Oil, Inc. Alkyl transfer of alkyl aromatics with chromium or vanadium and manganese and tin on mordenite. 3,825,613, Cl. 260-672.00t.
Knapp, Charles F.; and Eades, George S., to University of Kentucky Research Foundation, The. Dynamic childbirth simulator for teaching maternity patient care. 3,824,709, Cl. 36-2.0ae.
Knapsack Aktiengesellschaft: *See—*
Mietens, Gerhard; Kohler, Gerd; Haas, Hans; and Roszinski, Hilmar, 3,825,628.
Preisler, Eberhard; Grapentin, Kurt; Harmsen, Ernst; and Harnisch, Heinz, 3,825,652.
Schneider-Arnoldi, Alfred; Gabler, Helmut; and Kandler, Joachim, 3,825,433.
Knight, Lloyd K., to Galion, Jeffrey, Inc. Feeding mechanism for reduction apparatus. 3,825,192, Cl. 241-186.00r.
Knoebel, Gordon W.: *See—*
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Kobayashi, Hajime: *See—*
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Kobayashi, Hiromasa; Oguchi, Yuzo; and Nakata, Kazuhiko, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Magnetic card reader-recorder. 3,825,950, Cl. 360-109.000.
Kobayashi, Kazuhiko: *See—*
Saito, Nagao; Kobayashi, Kazuhiko; and Takagi, Shigeru, 3,825,715.
Kobayashi, Kengo; Manabe, Mitsuo; and Isobe, Shinichi, to Fujitsu Limited. Numerical control system. 3,825,731, Cl. 235-151.110.
Kobayashi, Nobuyuki: *See—*
Someya, Teruo; Kobayashi, Nobuyuki; and Goto, Toshinori, 3,825,839.
Kobayashi, Yasushi, to Nissan Motor Company. Method and apparatus for the fabrication of condenser yarns. 3,824,774, Cl. 57-24.000.
Kobe, Inc.: *See—*

McArthur, Ralph F.; Geurts, Melle F.; and Kelleher, John M., 3,825,285.

Kobylar, Alex W.: *See—*
Kelly, Michael J.; Kobylar, Alex W.; and Rekiere, Bernard J., 3,825,690.

Kobylinski, Tadeusz P.; and Taylor, Brian W., to Gulf Research & Development Company. Process for reducing the content of nitrogen oxides in the exhaust gases from enternal combustion engines. 3,825,654, Cl. 423-213.700.

Koch, Carl, to Sinar AG Schaffhausen. Photographic focusing screen camera. 3,825,938, Cl. 354-160.000.

Kodama, Yutaka: *See—*
Ishimaru, Toshiyasu; and Kodama, Yutaka, 3,825,531.

Koehler, Waldemar: *See—*
Schecker, Hans-Georg; Koehler, Waldemar; and Sander, Bruno, 3,825,568.

Koehring Company: *See—*
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Koenig, Dr. Ing., AG: *See—*
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Koerner, Ralph J., to Canoga Controls Corporation. Vehicle detection system. 3,825,889, Cl. 340-38.001.

Koga, Koichi: *See—*
Akamatsu, Takashi; Koga, Koichi; Kondo, Mitsuru; Miyake, Makoto; and Iwasaki, Hiroshi, 3,825,561.

Kohler, Gerd: *See—*
Mietens, Gerhard; Kohler, Gerd; Haas, Hans; and Roszinski, Hilmar, 3,825,628.

Kohlstette, Werner; and Hemfort, Heinz, Jr., to Westfalia Separator AG. Self-dumping drum centrifuge for the clarification of liquids, equipped with a paring disk for removing the clarified liquid under pressure. 3,825,177, Cl. 233-20.00a.

Koiso, Kazuhiro: *See—*
Ojima, Tadato; Koiso, Kazuhiro; and Nakano, Toshihiko, 3,825,877.

Koizumi, Yasumi, to Alps Electric Co., Ltd. Helical resonator. 3,825,862, Cl. 333-83.00r.

Kokado, Hiroshi: *See—*
Inoue, Eiichi; Tsujiuchi, Junpei; Kokado, Hiroshi; Yamaguchi, Takashi; Shimizu, Isamu; Sakuma, Hiraku; Hanada, Hiroshi; and Tokunaga, Yukio, 3,825,317.

Kokura, Satoshi; Taki, Genzi; and Watanabe, Kiyoshi, to Hitachi, Ltd. Electroslag welding method. 3,825,716, Cl. 219-73.000.

Kokusan Denki Co., Ltd: *See—*
Katsumata, Mitsuo; Miyamoto, Mitsunori; and Shirai, Kiyoshi, 3,824,976.

Kolb, Alfred Reeves, to Brown & Root, Inc. Pile mounted drilling rig and method. 3,825,076, Cl. 175-5.000.

Koleske, Joseph Victor; Roberts, Rene Marie-Joseph; and DelGiudice, Frank Paul, to Union Carbide Corporation. ABA block polymers of polyesters and polyethers. 3,825,620, Cl. 260-873.000.

Kolibas, James A., to Addressograph-Multigraph Corporation. Optical system with selectable feeds. 3,825,338, Cl. 355-50.000.

Komorek, Anthony J.; and Damour, Lawrence R., said Komorek assor. to said Damour, Lawrence R. Expanding mandrel or chuck. 3,825,167, Cl. 229-2.000.

Kondo, Mitsuru: *See—*
Akamatsu, Takashi; Koga, Koichi; Kondo, Mitsuru; Miyake, Makoto; and Iwasaki, Hiroshi, 3,825,561.

Kondo, Ryozo. Air supply device. 3,825,374, Cl. 417-413.000.

Kondou, Masakazu: *See—*
Amemiya, Kiyoshi; Kondou, Masakazu; Yamazaki, Kazuhiko; and Kanai, Fumio, 3,825,858.

Konishiroku Photo Industry Co., Ltd.: *See—*
Furuya, Tetsuo; Ibe, Yoshio; Kanisawa, Hideo; and Sugino, Osakazu, 3,825,429.

Konorova, Elena Laexandrovna: *See—*
Kozlov, Stanislav Fedorovich; and Konorova, Elena Laexandrovna, 3,824,680.

Kontz, Robert F., to Owens-Illinois, Inc. Blow mold latching mechanism including a safety feature. 3,825,396, Cl. 425-450.00c.

Korin Limited: *See—*
Takabayashi, Teruo, 3,824,654.

Korn, Darryl K.: *See—*
Peterman, Neil R.; Korn, Darryl K.; and Millard, Stephen, 3,825,844.

Korner, Renzo L.; White, Ralph J.; Shaffer, Robert A.; and Turner, George R., to Westinghouse Electric Corporation. High temperature, high pressure electrical penetration assembly. 3,825,669, Cl. 174-11.00r.

Kortman, Joe M., 50% to Hayward, H. Dutton, trustee of the Hilda Trusts and 50% to Schulein, Joseph, and Schulein, Margarite A. Electrical signal register. 3,825,935, Cl. 346-34.000.

Kosarko, Gerald Julius; Holzhauser, Ronald Charles; and Marvin, Edgar Samuel, to Eastman Kodak Company. Sound motion picture camera. 3,825,327, Cl. 352-29.000.

Kotani, Motoharu: *See—*
Kudo, Teizo; Ikeda, Saizo; Sonoyama, Yuzo; and Kotani, Motoharu, 3,825,625.

Kotera, Hiroaki: *See—*
Tsuchiya, Hiroyoshi; Tsuda, Yukifumi; Hayami, Heijiro; and Kotera, Hiroaki, 3,825,678.

Koto, Nobuhisa: *See—*
Farrell, Greg; Tsuji, Akira; Hasimoto, Dojun; Koto, Nobuhisa; and Hirai, Nobutake, 3,825,679.

Kotzsch, Hans-Joachim; and Vahlensieck, Hans-Joachim, to Dynamit Nobel Aktiengesellschaft. Siliceous dioxolane derivatives. 3,825,567, Cl. 260-340.200.

Kovach, Stephen M.: *See—*
Kmecak, Ronald A.; and Kovach, Stephen M., 3,825,613.
Patrick, Ralph R.; Kmecak, Ronald A.; and Kovach, Stephen M., 3,825,503.

Kozlov, Stanislav Fedorovich; and Konorova, Elena Laexandrovna, to Ordena Lenina Fizichesky Institut Imeni P.N. Lebedeva. Nuclear radiation detector and method of manufacture same. 3,824,680, Cl. 29-592.000.

Kraals, Ralph. Battery cover. 3,825,447, Cl. 136-166.000.

Kraftwerk Union Aktiengesellschaft: *See—*
Duffert, Heinrich, 3,825,783.

Kramell, Hans Peter, to Xerox Corporation. Telephone handset vibrator. 3,825,686, Cl. 179-1.00c.

Kramer, Emil; and Vangsgaard, Eigil, to Interessentskabet Nyborg Plast, Fabrikation og handel. Packing assembly and method of its manufacture. 3,825,113, Cl. 206-386.000.

Krause, Richard P.: *See—*
Miller, John S., 3,824,829.

Krause, Richard P. Support for metal bar being tapered. 3,825,117, Cl. 209-217.000.

Kress, Edward S. Slag pot carrier. 3,825,135, Cl. 214-313.000.

Krier, Keith N.; Brown, Neil F.; and Waldhauser, Steven J.A., to Tennant Company. Scrubbing machine. 3,824,645, Cl. 15-50.00c.

Kriger, Semen Davidovich: *See—*
Nekrasov, Lev Borisovich; Misnik, Jury Mikhailovich; Tsukernik, Zolya Samuilovich; Kriger, Semen Davidovich; and Kilkeev, Renat Shakhimardanovich, 3,824,718.

Kristel, Ira B.: *See—*
Aronson, Theodore F., 3,824,932.

Krolak, Ronald L.; and Oestmann, Eldon D., to Caterpillar Tractor Co. Track frame reciprocating mechanism for track-type tractors. 3,825,309, Cl. 305-31.000.

Krotkov, Vladimir Nikolaevich: *See—*
Starostin, Jury Stepanovich; Plokhov, Viktor Ivanovich; Erokhov, Veniamin Kuzmich; Ivanov, Vladimir Prokopievich; Krotkov, Vladimir Nikolaevich; Anisimov, Albert Viktorovich; Ajupov, Rustem Nurievich; and Golovinov, Mikhail Fedortovich, 3,824,832.

Kruck, Ralph E., to VCA Metal Fabrications, Inc. Sealed hypodermic syringe. 3,825,003, Cl. 128-218.0nv.

Krumbein, Fritz; and Lieckfeldt, Hans, to Bosch, Robert, Photokino GmbH. Projector with adjustable image reflecting mirror. 3,825,218 Cl. 248-466.000.

Krups, Robert: *See—*
Baumann, Kurt, 3,824,687.

Kubik, Paul P. Revolver loader. 3,824,729, Cl. 42-89.000.

Kubota, Koji; Yoshihara, Yasuhiko; Hirakawa, Hayao; Kamijo, Hirotaka; Nosaki, Shigeki; Yoshinaga, Fumihiro; Okumura, Shinji; and Okada, Hiroshi, to Ajinomoto Co., Inc. Method of producing L-lysine by fermentation. 3,825,472, Cl. 195-29.000.

Kudamatsu, Akio: *See—*
Kishino, Shigeo; Kudamatsu, Akio; Takase, Iwao; Shiokawa, Kozo; and Yamaguchi, Shini-Ichi, 3,825,636.

Kudo, Teizo; Ikeda, Saizo; Sonoyama, Yuzo; and Kotani, Motoharu, to Daicel Ltd. Process for producing high impact resistance resins. 3,825,625, Cl. 260-880.00r.

Kuhling, Dieter; and Bloching, Helmut, to Henkel & Cie GmbH. N-acylated tetraaza-bicyclo-nonandiones and compositions for activating oxygen. 3,825,543, Cl. 260-256.40f.

Kulkarni, Kishor M., to ITT Research Institute. Forging of rigid crystalline plastics. 3,825,648, Cl. 264-322.000.

Kumagai, Henry Yasuo; and McKnight, Hugh Morris, to Western Electric Company, Incorporated. Solid capacitor. 3,825,802, Cl. 317-230.000.

Kunzinger, Charles A.: *See—*
Hamel, Harvey C.; Kunzinger, Charles A.; and Stelzenmuller, William K., 3,825,906.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Murayama, Naohiro; and Fukuda, Makoto, 3,825,519.

Kurihara, Norman H.; and Bublitz, Donald E., to Dow Chemical Company, The. Bis-p-dithiino(2,3-b:2',3'-e) pyridine-2, 3,7,8,10 pentacarbonitrile. 3,825,548, Cl. 260-294.80b.

Kurihara, Osamu: *See—*
Ashida, Takao; Kurihara, Osamu; Nawata, Kiyoshi; Shinoki, Takanori; Fujita, Yutaka; Yamashita, Gentaro; and Saiki, Noritsugu, 3,825,508.

Kurka, Kurt A., to Minnesota Mining and Manufacturing Company. Light-sensitive composition and method. 3,825,430, Cl. 96-115.00r.

Kurth, Dieter: *See—*
Hussmann, Jurgen; and Kurth, Dieter, 3,825,236.

Kurtz, Leo. Seat fastening means. 3,825,302, Cl. 297-452.000.

La Flair, Ronald Turner, to Polysar Limited. Process for preparing block copolymers of alpha methyl styrene and conjugated diolefins. 3,825,623, Cl. 260-879.000.

La Flame, Frank E.; and Sones, William L., to General Motors Corporation. Fuel supply system with pressure regulator. 3,824,974, Cl. 123-136.000.

La Rue, Mervin W., Jr., to Bell & Howell Company. Viscous sensor. 3,825,207, Cl. 242-191-.

Laakkonen, Launo, to Temet Oy. Lock chamber for protective enclosures. 3,824,934, Cl. 109-1.000.

Laauwe, Robert H. Aerosol valve assembly. 3,825,159, Cl. 222-402.240.

Labeda, Robert C.: *See—*
Paramonoff, Elpidifor; Olsen, Frederick C.; and Labeda, Robert C., 3,825,270.

Laborit, Henri. 3(Morphocinoethoxy)pyridazines. 3,825,540, Cl. 260-247.50r.

LaCamera, Alfred F.: *See—*
Hartmann, John E.; LaCamera, Alfred F.; and Lake, Peter B., 3,825,448.

Laidlaw, H. Gordon, Jr.; and Levin, Berton P., to Sierracin Corporation, The. Impact sensitive security window system. 3,825,918, Cl. 340-274.000.

Laing, Nikolaus. Method for charging a heat storage vessel. 3,825,059, Cl. 165-1.000.

l'Air Liquide: *See—*
Moret, Bernard; and Dufetele, Jean-Louis, 3,824,739.

Lajiness, Thomas A., to Johnson, S. C., & Son, Inc. 3-Substituted 4 alkanoyl oxazaspiro insect repellents. 3,825,555, Cl. 260-307.00f.

Lake, Peter B.: *See—*
Hartmann, John E.; LaCamera, Alfred F.; and Lake, Peter B., 3,825,448.

Lale, Peter Gilbert; and Becker, Denis John, to Devices Limited. Implantable cardiac pacemaker with battery voltage-responsive rate. 3,825,016, Cl. 128-419.00p.

Lalu, Jean-Pierre; and Foulletier, Louis, to Produits Chemiques Ugine Kuhlmann. Method of preparing polyfluorinated sulphonic acids and derivatives. 3,825,577, Cl. 260-435.00r.

Landis Tool Company: *See—*
Price, Ralph E.; and Schoonover, Stanley C., 3,824,743.

Landwer, Donald C., to Teletype Corporation. Rotary disc recording and readout system having capacitance controlled lens positioning means. 3,825,323, Cl. 350-255.000.

Langenscheid, Erhard: *See—*
Klemm, Kurt; and Langenscheid, Erhard, 3,825,589.

Langenstein & Schemann Aktiegesellschaft: *See—*
Bachmann, Horst, 3,824,833.

Langer, Karl, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Flexible printing plate locking device for rotary printing press. 3,824,928, Cl. 101-415.100.

Langwell, John D., to Alexander, Herman. Shelf display article. 3,824,720, Cl. 40-10.000.

Lanman, Robert W., to Hadady Machining Co., Inc. Center drilling hold-down device. 3,825,363, Cl. 408-124.000.

Lannen Sokeri Oy: *See—*
Nisula, Pentti Samuel, 3,825,199.

Lapham, Sidney D. Material handling system. 3,825,130, Cl. 214-16.00b.

Laran, Roy Joseph: *See—*
Eckert, Robert John, Jr.; and Laran, Roy Joseph, 3,825,658.

Larsen, Dee E.; and Clements Michael R., to Amdahl Corporation. Operand comparator. 3,825,895, Cl. 340-146.200.

Larson, Russell H.: *See—*
Burk, John L.; Duffy, Daniel M.; Hogan, Spurgeon G., Jr.; Larson, Russell H.; and McGilvray, Bruce L., 3,825,904.

Laser Alignment, Inc.: *See—*
Roodvoets, Roger J.; and Nielsen, Edward G., 3,824,666.

Laserplane Corporation: *See—*
Teach, Ted L., 3,825,808.

Laudato, Gaetano J., Jr. Water cooler. 3,824,801, Cl. 62-201.000.

Laughrey, Richard A.: *See—*
Gracia, Robert F.; Laughrey, Richard A.; and Tuohey, Paul F., 3,825,424.

Laurence, Robert S.: *See—*
Damon, Neil F.; Laurence, Robert S.; and Hoy, Ralph C., 3,825,876.

Lauss, Hans-Dietrich: *See—*
Eipeltauer, Eduard; Lauss, Hans-Dietrich; and Spreckelmeyer, Bernhard, 3,825,655.

Lawlor, John; and Sgombick, John, to Xerox Corporation. Educational device. 3,824,708, Cl. 35-19.00r.

Lawlor, John; and Sgombick, John, to Xerox Corporation. Educational device. 3,824,711, Cl. 35-19.00r.

Lawson, William M.: *See—*
Wojcik, Gerald E.; and Lawson, William M., 3,825,468.

Lawton, James: *See—*
Johnston, Philip Douglas; Lawton, James; and Mackison, Ian, 3,825,415.

Lawton, Richard A., to Electronic Surveillance Corporation Limited. Transmitter control circuit for alarm system. 3,825,897, Cl. 340-147.0lp.

Lay, Clark M.: *See—*
Bowers, Gary L.; Lay, Clark M.; and Stephans, Albert E., 3,825,735.

LeCrenn, George C.: *See—*
Furrey, John H.; and LeCrenn, George C., 3,825,673.

Lectrasearch Corporation: *See—*
Jaggers, H. Dane, 3,825,666.

Lee, Hwalin: *See—*
Pallos, Ferenc M.; Lee, Hwalin; and Menn, Julius J., 3,825,602.

Lee, Raymond, Organization, Inc., The: *See—*
Riley, Frank E. C., 3,825,743.

Lee, Robert G.; and Mitchell, Robert D., to Tennessee Valley Authority. Urea-ammonium polyphosphate production. 3,825,414, Cl. 71-29.000.

Leftheris, Basil P., to Grumman, Aerospace Corporation. Method and apparatus for deforming metal. 3,824,824, Cl. 72-56.000.

Leigh Instruments Limited: *See—*
Price, Ronald; and Kelemen, Jozsef W., 3,825,934.

Lemcke, Robert: *See—*
Bach, Bert; and Lemcke, Robert, 3,824,632.

Lenk, Erich: *See—*
Schippers, Heinz; Lenk, Erich; and Busch, Hansjochen, 3,825,206.

Lenz, Ludwig J.; and Thompson, Robert Stanley, to United Stated of America, Army. Aiming device for indirect fire guns. 3,824,699, Cl. 33-334.000.

Lesperance, Lawrence M.; Drewry, Hugh S.; and Vegners, Gunars, to Allis-Chalmers Corporation. Length measuring system having automatic update of roll diameter compenstion value. 3,824,694, Cl. 33-141.00r.

LeVantine, Allan D.; and Curtis, Daniel L. Fingerprinting machine. 3,824,951, Cl. 118-31.500.

Levin, Berton P.: *See—*
Laidlaw, H. Gordon, Jr.; and Levin, Berton P., 3,825,918.

Levin, Berton P.; and Nelson, Roger E., to Sierracin Corporation, The. Laminated security window. 3,825,919, Cl. 340-274.000.

Levin, Robert E., to GTE Sylvania Incorporated. Lamp unit with controlled-diffusion reflector and method of making the reflector. 3,825,742, Cl. 240-103.00r.

Levine, Seymour D.: *See—*
Cimarusti, Christopher M.; Giarrusso, Frederick F.; and Levine, Seymour D., 3,825,566.

Lewelling, James D.: *See—*
Bondie, Dale J.; Sutton, Robert S.; and Lewelling, James D., 3,824,892.

Lewis, Geoffrey Arthur, to Lucas Aerospace Limited. Reversible turbine with inlet and brake control system. 3,825,367, Cl. 415-153.000.

Lewis, George E., to Bear Brand Hosiery Co. Pneumatic package loader. 3,824,763, Cl. 53-255.000.

Lewis, Keith, to Lucas Electrical Company Limited, The. Electrical switch. 3,825,711, Cl. 200-67.00g.

Lianza, William J.: *See—*
Christensen, Burton G.; and Lianza, William J., 3,825,631.

Licata, William H.: *See—*
Bell, Henry P.; and Licata, William H., 3,825,840.

Licentia Patent Verwaltungs-G.m.b.H.: *See—*
Dassler, Alfred, 3,825,782.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Roder, Wolfgang; Volkner, Wolfgang; and Rusch, Dieter, 3,825,371.
Scherber, Werner, 3,824,677.

Lichtenberger, Harold V.; and Ruoss, Christian W., to Combustion Engineering, Inc. Self-closing control rod grippers. 3,825,160, Cl. 226-59.000.

Lidikay, Lyle M.; and Wilde, Sheldon L., to H-C Industries, Inc. Drive apparatus for metering apparatus. 3,825,044, Cl. 141-187.000.

Lieberman, Edgar M.; and Snyder, Bobbie L., to Fixtures Mfg. Corporation. Chair and ganging structure. 3,825,300, Cl. 297-248.000.

Lieckfeldt, Hans: *See—*
Krumbein, Fritz; and Lieckfeldt, Hans, 3,825,218.

Liggett & Myers Incorporated: *See—*
Vanhall, Floyd, 3,824,906.

Ligon, Elmer R.; and Reed, Norman D., to Dickey, W. S., Clay Manufacturing Company. Apparatus for forming pipe coupling. 3,825,392, Cl. 425-387.000.

Ligtenberg, Martinus Adrianus Cornelis; Stevels, Albert Leendert Nicolaas; and De Pauw, Agnes Desiree Maria, to U.S. Philips Corporation. Luminescent screen having a mosaic structure. 3,825,763, Cl. 250-486.000.

Lilly, Eli, and Company: *See—*
Emmick, Thomas L., 3,825,661.

Lincoln Brass Works, Inc.: *See—*
Duperow, Donald E.; and Ferlin, William J., 3,825,402.

Lincoln Electric Company, The: *See—*
Carroll, John E.; and Stump, Carl E., 3,825,721.

Lind, Willard E., to Jaw-Bar Plastics Corporation. Load bearing pallet and interlock. 3,824,933, Cl. 108-51.000.

Linder, Donald L., to Motorola, Inc. Small signal amplifier. 3,825,849, Cl. 330-17.000.

Lindqvist, Stig Ture, to Ingenjorsfirman Vattenanlaggningar. Arrangement in swimming pools. 3,824,634, Cl. 4-172.170.

Lindsay, Maurice E. Body controlled heat range and extended gap spark plug. 3,825,784, Cl. 313-11.500.

Linford, Rodney M. F.: *See—*
United States of America, National Aeronautics and Space Administration, 3,825,760.

Lingl Corporation: *See—*
Schwarz, Josef, 3,825,293.

Lion Fat and Oil Company, Ltd.: *See—*
Murakami, Keiichi; Hoshi, Hiroshi; Hirakawa, Michio; and Susuki, Rinnosuke, 3,825,656.

Lipson, Charles S.: *See—*
Nicholson, James E.; and Lipson, Charles S., 3,824,992.

List, Hans: *See—*

Skatsche, Othmar; Thien, Gerhard; and Kirchweger, Karl, 3,824,971.

Litner, Frank W.; and Childress, Bobby B., to Coltron Industries, Inc. Thermal systems incorporating apparatus and methods for simulating time related temperatures. 3,825,725, Cl. 219-530.000.

Litsinger, George M.: *See—*
Heenan, Richard H.; and Litsinger, George M., 3,825,186.

Little, Arthur D., Inc.: *See—*
Menashi, Wilson P.; Wenckus, Joseph F.; and Castonguay, Roger A., 3,825,242.

Little, Edwin D.: *See—*
Weedon, Gene C.; and Little, Edwin D., 3,825,619.

Litton Industrial Products, Inc.: *See—*
Carroll, Richard R., 3,824,891.

Lloyd, James R.; Williams, Robert E.; Bayless, Jack H.; Ortloff, Gerald D.; and Bruce, George H., to Esso Production Research Company. Method and apparatus for drilling in deep water. 3,825,065, Cl. 166-.500.

Lockheed Aircraft Corporation: *See—*
Maltenieks, Otto J., 3,825,578.
Wirt, Leslie Spencer; and Morrow, Duane Lloyd, 3,824,842.

Lockheed Missiles & Space Company, Inc.: *See—*
Buchanan, Robert A.; Alves, Ronald V.; Maple, T. Grant; and Sobon, Leon E., 3,825,436.

Lockner, Avery: *See—*
Rubin, Jerome; and Lockner, Avery, 3,825,947.

Lodige, Fritz: *See—*
Lodige, Wilhelm; Lodige, Fritz; Lucke, Josef; and Luke, Karlheinz, 3,825,193.

Lodige, Wilhelm; Lodige, Fritz; Lucke, Josef; and Luke, Karlheinz. Granulating apparatus. 3,825,193, Cl. 241-187.000.

Loesch, Claude E.: *See—*
Loesch, Leo J.; and Loesch, Claude E., 3,824,871.

Loesch, Leo J.; and Loesch, Claude E. Drive for bunk feeder. 3,824,871, Cl. 74-422.000.

Loev, Bernard, to Smithkline Corporation. N-alkenyl and n-alkynyl thioamides. 3,825,547, Cl. 260-294.80e.

Lohkamp, Dwight T.; and Keller, James P., to Esso Research and Engineering Company. Melt-blowing die using capillary tubes. 3,825,379, Cl. 425-72.000.

London, Joe F., Jr., to Burlington Industries, Inc. Fabric having improved pick resistance. 3,824,776, Cl. 57-140.00j.

Long, Martin L., Jr.: *See—*
Branovich, Louis E.; Fitzpatrick, William B. P.; and Long, Martin L., Jr., 3,825,440.

Long, Robert G., to D.D.I. Communications, Inc. Digital data interface system. 3,825,696, Cl. 179-15.00a.

Long, Robert Gordon, to D.D.I. Communications, Inc. Digital data interface scanning system. 3,825,695, Cl. 179-15.00a.

Longenecker, Levi S. Panelized suspended furnace roof and improved feed hole. 3,825,409, Cl. 432-250.000.

Loomis, Francis B., to St. Lawrence Engine Co. Limited, The. Aircraft ground handling equipment. 3,825,869, Cl. 214-331.000.

Lorain Products Corporation: *See—*
Chambers, Charles W., Jr., 3,825,698.

Loreau, Joseph Andre: *See—*
Malon, Jean-Pierre; and Loreau, Joseph Andre, 3,825,672.

Lorenz, Gerhardt, to Sartorius-Membranfilter GmbH. Method of and apparatus for use in measuring the particle size distribution and/or the concentration of particles in suspension in a gaseous dispersing medium. 3,825,345, Cl. 356-85.000.

Loro, Alberto, to Microsystems International Limited. Mounting leads and method of fabrication. 3,825,353, Cl. 357-68.000.

Lorraine Industries, Inc.: *See—*
Hughes, David C.; and Sherwood, Henry A., 3,825,847.

Lowe, Jere L., to General Tire & Rubber Company, The. Method and apparatus for vacuum assembling of bushings. 3,824,660, Cl. 29-149.5nm.

Lubbers, Dietrich Werner; Wodick, Reinhard; and Piroth, Dieter, to Max-Planck-Gesellschaft zur Forderung der-Wissenschaften e.V. Computing type optical absorption mixture analyzer. 3,825,342, Cl. 356-41.000.

Lucas Aerospace Limited: *See—*
Lewis, Geoffrey Arthur, 3,825,367.
Skinner, Robert Thomas John, 3,824,786.

Lucas Electrical Company Limited, The: *See—*
Lewis, Keith, 3,825,711.

Lucas, Frank L., to Xerox Corporation. Color balance display. 3,825,337, Cl. 355-4.000.

Lucas, Howard Robert; and Olsen, Robert Nils, to American Cyanamid Company. Process for improving the property profile or rubber-polymer systems. 3,825,515, Cl. 260-31.80m.

Lucas, Joseph, (Industries) Limited: *See—*
Bottoms, Harry Simister, 3,825,377.

Lucian, Arsene N. Transducer device. 3,825,709, Cl. 200-192.000.

Lucke, Josef: *See—*
Lodige, Wilhelm; Lodige, Fritz; Lucke, Josef; and Luke, Karlheinz, 3,825,193.

Lucky, Clyde L.: *See—*
Nelson, Roger E.; and Lucky, Clyde L., 3,825,920.

Lucky, Clyde L., to Sierracin Corporation, The. Security window. 3,825,917, Cl. 340-274.000.

Luethi, Christian: *See—*
Weber, Kurt; and Luethi, Christian, 3,825,534.

Luke, Karlheinz: *See—*
Lodige, Wilhelm; Lodige, Fritz; Lucke, Josef; and Luke, Karlheinz, 3,825,193.

Luley, Wilbert E.: *See—*
Valentine, John P.; and Luley, Wilbert E., 3,824,766.

Lundberg, Anders; and Axelsson, Rolf, to Stal Refrigeration AB. Compact compressor unit. 3,825,372, Cl. 417-321.000.

Lunden, Clarence D.: *See—*
Hensen, Karl A.; and Lunden, Clarence D., 3,825,819.

Lustenberger, Hans, to Fischer, Georg, Aktiengesellschaft. Device for making nodular cast iron. 3,825,240, Cl. 266-34.00t.

Lutz, Eugene F., to Shell Oil Company. Ethylene oligomerization process. 3,825,615, Cl. 260-683.15d.

Lutz, Gerhard: *See—*
Mosch, Willi; Lutz, Gerhard; and Martin, Heinz, 3,824,679.

Lyshkow, Norman A., to Combustion Equipment Associates, Inc. Gas permeator. 3,824,836, Cl. 73-1.00r.

Maas, Dieter: *See—*
Engelsmann, Dieter; Maas, Dieter; and Schroder, Rolf, 3,825,939.

Macardy, Douglas; and Kelly, Ian William. Water jet propulsion unit. 3,824,946, Cl. 115-12.00r.

MacCarthy, Richard W. Electrochemical cell with catalyzed acid peroxide electrolyte. 3,825,445, Cl. 136-83.00r.

MacEwan, George E., to Phillips Petroleum Company. Gable top container. 3,825,168, Cl. 229-179.000.

Machlanski, Sigmund H. Orchard heating system and burner. 3,825,183, Cl. 236-93.000.

Machlett Laboratories, Incorporated, The: *See—*
Doolittle, Howard D., 3,825,787.

Mackison, Ian: *See—*
Johnston, Philip Douglas; Lawton, James; and Mackison, Ian, 3,825,415.

Mackrill, David; Carpenter, Denis Cecil John; and Howard, Michael John, to Sheppard Equipment Limited. Vehicle for transporting a container. 3,825,137, Cl. 214-515.000.

Maeda, Itsuji: *See—*
Seki, Takeo; Kawamura, Shigenori; Maeda, Itsuji; and Kaneko, Akira, 3,825,351.

Maeda, Tsuneo; and Hattori, Masaichi, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Timing holding device for head lamp circuit. 3,825,797, Cl. 315-83.000.

Magee, Philip S., to Chevron Research Company. N-aralkanoyl and N-aralkenoyl derivatives of o, S-dihydrocarbylphosphoroamidothioates and S, s-dihydrocarbylphosphoroamidodithioates. 3,825,634, Cl. 260-956.000.

Magnaflux Corporation: *See—*
Flaherty, John J.; and Strauts, Eric J., 3,825,820.

Magnavox Company, The: *See—*
Mayle, Louis F., 3,825,838.

Mahacek, Michael F.: *See—*
Cary, John M.; and Mahacek, Michael F., 3,825,107.

Mahon, Roger, to American Standard, Inc. Aircraft instrument shroud. 3,824,853, Cl. 73-181.000.

Maierson, Theodore, to National Cash Register Company, The. Process for manufacturing a porous, solid, article. 3,825,640, Cl. 264-87.000.

Malon, Jean-Pierre; and Loreau, Joseph Andre. Device emitting or receiving electrical signals resulting from the movement of a vehicle along the device. 3,825,672, Cl. 174-97.000.

Maltenieks, Otto J., to Lockheed Aircraft Corporation. Water repellent composition of organosilicon complex. 3,825,578, Cl. 260-448.80r.

Manabe, Mitsuo: *See—*
Kobayashi, Kengo; Manabe, Mitsuo; and Isobe, Shinichi, 3,825,731.

Mandusky, Jack C., to Hoover Ball and Bearing Company. Spring locating apparatus for box spring assemblies. 3,824,639, Cl. 5-260.000.

Mangiavacchi, Jacques, to Societe Anonyme: Glaenzer Spicer. Counterbalancing device for coupling shafts for universal joints. 3,824,808, Cl. 64-17.00a.

Mannesmann-Meer Aktiengesellschaft: *See—*
Hansgen, Klaus; Ridder, Gerhard; and Schuhmann, Bernd, 3,824,879.

Mannheimer, Rudy: *See—*
Johnston, Daniel H.; Mannheimer, Rudy; Rinkleib, Helfried O.; Walker, Ivan D.; and Kellner, John R., 3,825,208.

Maple, T. Grant: *See—*
Buchanan, Robert A.; Alves, Ronald V.; Maple, T. Grant; and Sobon, Leon E., 3,825,436.

Marathon Oil Company: *See—*
Norton, Charles J.; and Falk, David O., 3,825,068.
Norton, Charles J.; and Falk, David O., 3,825,069.
Vestal, Charles R., 3,825,067.

Marcatili, Enrique Alfredo Jose: *See—*
Cook, John Stone; and Marcatili, Enrique Alfredo Jose, 3,825,319.

Marchard, Gustav, to Gebr. Bohler & Co., AG. Stamping knife. 3,824,887, Cl. 83-679.000.

Marconi Company Limited, The: *See—*
Davies, Eric, 3,825,930.

Marendaz, Georges-Andre, to Ateliers des Charmilles S.A. Method and apparatus for controlling the feed of an electrode-tool relative to a workpiece in electrical discharge machining. 3,825,714, Cl. 219-69.00g.

Marinelli, Donald Paul; and Stockton, Thomas Edward, to RCA Corporation. Method of depositing epitaxial layers on a substrate from the liquid phase. 3,825,449, Cl. 148-172.000.

Markhart, Albert H.; and Santer, James O., to Monsanto Company. Electroconductive resins and process of preparation. 3,825,511, Cl. 260-87.50r.

Markovsky, Grigory Fedorovich: *See*—
Sinichenko, Anatoly Afanasievich; Romanenko, Anatoly Mikhailovich; Sukhov, Evgeny Alexeevich; and Markovsky, Grigory Fedorovich, 3,824,760.

Marks, Alvin M.; and Marks, Mortimer M. Apparatus for coating television viewing tubes. 3,824,955, Cl. 118-500.000.

Marks, Mortimer M.: *See*—
Marks, Alvin M.; and Marks, Mortimer M., 3,824,955.

Marlen Manufacturing and Development Co.: *See*—
Fenton, Leonard, 3,825,005.

Maroschak, Ernest J. Fitting for corrugated plastic pipe. 3,825,288, Cl. 285-156.000.

Marquardt, Bernd: *See*—
Schober, Helmut; and Marquardt, Bernd, 3,825,765.

Marra, Frank: *See*—
Carlick, Daniel J.; Marra, Frank; and Sprenger, Gerhard E., 3,825,479.

Marshall, Robert Howard; and Wallace, Gary Leonard, to Chemetron Corporation. Method and apparatus for producing weight controlled groups of sliced food product. 3,824,885, Cl. 83-19.000.

Martin, Barry Forester; and Roberts, Edward David, to U.S. Philips Corporation. Methods of producing films comprising siliceous material and the article formed thereby. 3,825,466, Cl. 161-113.000.

Martin, Frank Herbert, to Bell Telephone Laboratories, Incorporated. Interlocking joint. 3,825,355, Cl. 403-104.000.

Martin, Gilbert, to Etat Francais, Delegation Ministerielle pour l'Armement. Device for separating electrolyte carried by Hydrogen during recharging of a storage battery. 3,825,444, Cl. 136-6.00p.

Martin, Heinz: *See*—
Mosch, Willi; Lutz, Gerhard; and Martin, Heinz, 3,824,679.

Martin, Louis, to Societe Anonyme: Poclain le Plessis-Belleville (Oise). Fluid ram provided with means for braking the ram piston at the end of its stroke. 3,824,895, Cl. 91-401.000.

Martin, Orval J., to Reliance Electric Company. Price computing scale with parity check of price entry. 3,825,085, Cl. 177-3.000.

Martin-Marietta Corporation: *See*—
Richards, Edward F.; and Depperman, Warren B., 3,825,739.

Marus, Louis J.: *See*—
Marus, Louis J.; and Abernathy, James D. (said Abernathyassor. of 7.4% to), 3,825,921.

Marus, Louis J.; and Abernathy, James D., said Abernathyassor. of 7.4% to Marus, Louis J. and 12.6% to Bogatin, Irvin. Trailer position indicator. 3,825,921, Cl. 340-282.000.

Maruscak, John; and Sine, Dale E., to GTE Automatic Electric Laboratories Incorporated. Building directory. 3,824,722, Cl. 40-64.00r.

Marvin, Edgar Samuel: *See*—
Kosarko, Gerald Julius; Holzhauser, Ronald Charles; and Marvin, Edgar Samuel, 3,825,327.

Marzocchi, Alfred, to Owens-Corning Fiberglas Corporation. Method of making multifilament yarns. 3,824,779, Cl. 57-162.000.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Sommer, Richard, 3,824,659.

Maschinenfabrik Augsburg-Nurnberg, Aktiengesellschaft Werk Nurnberg: *See*—
Gebeshuber, Johann; and Meusel, Wilhelm, 3,824,843.

Massachusetts Institute of Technology: *See*—
Keil, Alfred A. H.; and Vetter, Michael F., 3,824,944.

Massey-Ferguson Inc.: *See*—
Gardner, Guy F.; and Boyak, Arnold C., 3,825,073.

Massey-Ferguson Services N.V.: *See*—
Muller, Jean Claude, 3,824,864.

Massie, Stephen N., to Universal Oil Products Company. Preparation of ethers. 3,825,603, Cl. 260-612.00d.

Massillon-Cleveland-Akron Sign Company, The: *See*—
Friedrichsen, Thomas, 3,824,725.
Miller, Wendell V.; and Friedrichsen, Thomas, 3,824,724.

Mast, Fred, to Gretag Aktiengesellschaft. Illumination system. 3,825,322, Cl. 350-236.000.

Masuda, Hirotsugu: *See*—
Nakamura, Kihei; Yamazaki, Harumichi; Masuda, Hirotsugu; Sato, Takeshi; and Kiuchi, Yoshinori, 3,825,292.

Masuoka, Fujio, to Tokyo Shibaura Electric Co., Ltd. Field effect semiconductor memory apparatus with a floating gate. 3,825,945, Cl. 357-23.000.

Masygan, Raymond Joseph, to Clark, Alex L., Limited. Photographic developer apparatus. 3,825,943, Cl. 354-331.000.

Mathews, Bernard C.: *See*—
Pool, Stuart D., 3,825,138.

Matkovich, Vlado I.: *See*—
Economy, James; and Matkovich, Vlado I., 3,825,469.

Matsumura, Yoshihiro, to Sohgoh Jidosha Anzen-Kogai Gijutsu Kenkyu Kumiai. Anti-skid control system for vehicles. 3,825,799, Cl. 317-5.000.

Matsushita Electric Industrial Company, Limited: *See*—
Ojima, Tadato; Koiso, Kazuhiro; and Nakano, Toshihiko, 3,825,877.
Tsuchiya, Hiroyoshi; Tsuda, Yukifumi; Hayami, Heijiro; and Kotera, Hiroaki, 3,825,678.

Matsushita Seiko Company, Limited: *See*—
Ogawa, Masaya, 3,825,339.

Matsuyama, Takashi; Tanaka, Tetsuji; and Tezuka, Toshiro, to Bridgestone Tire Company Limited. Pneumatic rubber tire for off-road vehicles. 3,825,052, Cl. 152-353.000.

Matsuzawa, Katsuto; Matukuma, Akira; Takagishi, Iwao; and Yoshida, Kenji, to Mitsubishi Chemical Industries Limited. Process for preparing catechol and hydroquinone. 3,825,604, Cl. 260-621.00g.

Matsuzawa, Norio: *See*—
Wada, Shigeru; Oi, Hidesaburo; Matsuzawa, Norio; and Nishimura, Hiroshi, 3,825,524.

Mattel, Inc.: *See*—
Holland, Andrew M.; and Pester, William B., 3,825,268.
Pitkanen, Alan R.; Kennedy, Melvin R.; Nagel, Dietmar; Gross, William J.; and Bosley, Denis V., 3,825,265.

Matthews, Hugh B., to Sperry Rand Corporation. Geothermal energy system and method. 3,824,793, Cl. 60-641.000.

Matthews, Robert M.; and Petty, Albert W., to Kellwood Company. Panty garment with high rises at the latera portions of the panty. 3,824,812, Cl. 66-177.000.

Mattox, Robert J.: *See*—
Black, James R.; and Mattox, Robert J., 3,825,453.

Matukuma, Akira: *See*—
Matsuzawa, Katsuto; Matukuma, Akira; Takagishi, Iwao; and Yoshida, Kenji, 3,825,604.

Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See*—
Kaiser, Nils, 3,825,347.

Max-Planck-Gesellschaft zur Forderung der-Wissenschaften e.V.: *See*—
Lubbers, Dietrich Werner; Wodick, Reinhard; and Piroth, Dieter, 3,825,342.

Mayberry, Leonard A. Electromagnetic transducer for sensing movement of a thread-like object past a predetermined point. 3,825,818, Cl. 324-34.00r.

Mayle, Louis F., to Magnavox Company, The. Search tune detector circuit. 3,825,838, Cl. 325-470.000.

Mazue, Jack. Indexing workpiece supporting apparatus. 3,824,877, Cl. 74-814.000.

McArthur, Ralph F.; Geurts, Melle F.; and Kelleher, John M., to Kobe, Inc. Tubing stinger with hold down ring. 3,825,285, Cl. 285-27.000.

McCarthy, John Peter: *See*—
Beavitt, Alan Robert; and McCarthy, John Peter, 3,825,801.

McCaully, Ronald J.: *See*—
Nudelman, Abraham; and McCaully, Ronald J., 3,825,533.

McClay, Alexander W., Jr. Multiple gauging device. 3,824,695, Cl. 33-137.00r.

McClay, Alexander W., Jr. Multiple gauging device. 3,824,696, Cl. 33-137.00r.

McCrary, Avis L.; and Wilson, David A., to Dow Chemical Company, The. Phenolic aminopolycarboxylic chelants. 3,825,592, Cl. 260-519.000.

McCulloch Corporation: *See*—
Winfield, Merle, 3,824,978.

McDonald, Bernard. Surgical apparatus for closing wounds. 3,825,010, Cl. 128-337.000.

McDonald, John C.: *See*—
Baichtal, James R.; and McDonald, John C., 3,825,689.

McDuffee, William T., Jr.: *See*—
Gresky, Alan T.; Savolainen, Jouko E.; McDuffee, William T., Jr.; and Wischow, Russell P., 3,825,649.

McFarland, Archie Rae, to Beehive Machinery Inc. Twin screw continuous processing machine. 3,825,231, Cl. 259-41.000.

McGaugh, Michael C., to Dow Chemical Company, The. Ethylene polymer composition having enhanced photodegradability. 3,825,627, Cl. 260-897.00a.

McGaugh, Michael Calvin, to Dow Chemical Company, The. Ethylene polymer composition having enhanced photodegradability. 3,825,626, Cl. 260-897.00a.

McGilvray, Bruce L.: *See*—
Burk, John L.; Duffy, Daniel M.; Hogan, Spurgeon G., Jr.; Larson, Russell H.; and McGilvray, Bruce L., 3,825,904.

McGlashen, James N.: *See*—
Holroyd, Eric; Goodfellow, Anthony G.; and McGlashen, James N., 3,825,457.

McGuire, Martin J. Glide swing. 3,825,254, Cl. 272-85.000.

McKenna, Kerry Charles: *See*—
Stafford, Donald Claude; Burns, Gerald Edward; and McKenna, Kerry Charles, 3,824,942.

McKnight, Hugh Morris: *See*—
Kumagai, Henry Yasuo; and McKnight, Hugh Morris, 3,825,802.

McLelland, John Douglas. Movement control apparatus. 3,824,900, Cl. 92-8.000.

McMahon, Harvey S. Apparatus for slant hole directional drilling. 3,825,081, Cl. 175-73.000.

McMahon, Joseph F., to Foster Wheeler Corporation. Fluidized bed reactor. 3,825,477, Cl. 196-126.000.

McManus, Walter K.; Bouffard, Joseph T.; and Harris, Lennard D., to Atlantic Service Co., Inc. Hand saw having demountable blade. 3,825,047, Cl. 145-31.00r.

McMurtry, David Roberts; and Agg, Michael John, to Rolls-Royce (1971) Limited. Pitch varying mechanism for variable pitch fan. 3,825,370, Cl. 416-160.000.

Mebus, Henry R.: *See—*
Fernandez-Rana; and Mebus, Henry R., 3,825,247.

Medical Alginates Limited: *See—*
Franklin, Kenneth John; and Bates, Keith, 3,824,997.

Medico Electronic Inc., mesne: *See—*
Morin, Leo G., 3,825,411.

Mee, Robert L. Drill assembly. 3,825,075, Cl. 173-43.000.

Meek, William H., to Ferro Corporation. Carboxylation of phenols. 3,825,593, Cl. 260-521.00c.

Meier, Paul, to Cutler-Hammer, Inc. Microwave transmission line. 3,825,863, Cl. 333-95.00r.

Meinholdt, John W. Sway control for trailers. 3,825,282, Cl. 280-446.00b.

Menashi, Wilson P.; Wenckus, Joseph F.; and Castonguay, Roger A., to Little, Arthur D., Inc. Method and apparatus for direct melt synthesis of intermetallic compounds. 3,825,242, Cl. 266-39.000.

Mende, Wilhelm, & Co.: *See—*
Ettel, Hubert, 3,825,462.

Mendes, Robert F. Fire ladder extension apparatus. 3,825,096, Cl. 182-86.000.

Menke, Wilhelm, to NSM-Apparatebau GmbH. Cash box with coin counter. 3,825,729, Cl. 235-92.0cn.

Menn, Julius J.: *See—*
Pallos, Ferenc M.; Lee, Hwalin; and Menn, Julius J., 3,825,602.

Menz, Elsie L., to Xerox Corporation. Image transfer process and also known as D/2888. 3,825,423, Cl. 96-1.400.

Merck & Co., Inc.: *See—*
Christensen, Burton G.; and Lianza, William J., 3,825,631.
Novello, Frederick C., 3,825,542.

Meri, Kalju, to Electrospace Corporation. Direct-coupled audio amplifier having unbypassed emitter resistor stages. 3,825,850, Cl. 330-19.000.

Merkle, Frank P., Jr. Basic suspended roof construction for industrial furnaces. 3,824,936, Cl. 110-99.00r.

Merrill, John T., IV 4 United States of America, National Aeronautics and Space Administration: *See—*
Ashworth, Billy R.; and Merrill, John T., IV 4 United States of America, National Aeronautics and Space Administration, 3,824,707.

Messina, Richard J.: *See—*
Messina, Victor J.; and Messina, Richard J., 3,825,290.

Messina, Victor J.; and Messina, Richard J. Sliding door lock bar apparatus. 3,825,290, Cl. 292-262.000.

Metcalf, Arthur G. B.; Guiffrida, Philip; and Bellows Alfred H., to Electronics Corporation of America. Fuel burner supervisory system. 3,825,913, Cl. 340-228.000.

Metz, Noble C. Self-cleaning tank washer. 3,825,022, Cl. 134-104.000.

Meusel, Wilhelm: *See—*
Gebeshuber, Johann; and Meusel, Wilhelm, 3,824,843.

Meyer, Konrad: *See—*
Jeuken, Josef; Vieregge, Gustav; and Meyer, Konrad, 3,824,820.

Meyers, George Leroy, to American Can Company. Paperboard container and blank therefor. 3,825,169, Cl. 229-34.00a.

MGM Hospital Supplies, Inc.: *See—*
Graven, William J., 3,825,013.

Miale, Joseph N., to Mobil Oil Corporation. Method of converting hydrocarbons with manganese nodule catalysts. 3,825,486, Cl. 208-110.000.

Michelsen, Jacob, to Kent-Moore Corporation. Ball stud remover. 3,824,672, Cl. 29-263.000.

Microsystems International Limited: *See—*
Loro, Alberto, 3,825,353.

Midland Industrial Computing Limited: *See—*
Anderson, John Ernest, 3,825,900.

Miedema, Hotze: *See—*
Felsberg, Robert Irving; and Miedema, Hotze, 3,825,843.

Mietens, Gerhard; Kohler, Gerd; Haas, Hans; and Roszinski, Hilmar, to Knapsack Aktiengesellschaft. Pastes containing acid, amines and phosphoric acid esters. 3,825,628, Cl. 260-920.000.

Mikkelsen, Eric, to Bang and Olufsen A/S. Tape recorder driver mechanism. 3,825,209, Cl. 242-201.000.

Mikuni Kogyo Kabushiki Kaisha: *See—*
Nishihara, Yoshio; and Ohashi, Isamu, 3,825,238.

Millard, Stephen: *See—*
Peterman, Neil R.; Korn, Darryl K.; and Millard, Stephen, 3,825,844.

Miller, Allan, to Phillips Screw Company. Safety lock with provision for key user identification. 3,825,898, Cl. 340-149.00r.

Miller, Harry B., to Industrie-Werke Karlsruhe Augsburg-Aktiengesellschaft. Drive roll for winders of filamentary material. 3,825,195, Cl. 242-18.0dd.

Miller, John S., to Krause, Richard P. Rolling mill with shifting cams for shaping bars. 3,824,829, Cl. 72-214.000.

Miller, John T., Jr.: *See—*
Parts, Leo P.; and Miller, John T., Jr., 3,825,520.

Miller, Lester F., Jr.: *See—*
Ott, Owen J.; Ginn, David W.; and Miller, Lester F., Jr., 3,825,936.

Miller, Richard K., to Goodrich, B. F., Company, The. Initiator emulsion for olefinic polymerization reactions. 3,825,509, Cl. 260-86.300.

Miller, Robert C.: *See—*
Carr, Walter J., Jr.; and Miller, Robert C., 3,825,910.

Miller, Roy E., to Blue Bell Inc., mesne. Material edge aligning device. 3,825,250, Cl. 271-250.000.

Miller, Tom B.: *See—*
Noponen, Harold W.; and Miller, Tom B., 3,825,147.

Miller, Wendell V.; and Friedrichsen, Thomas, to Massillon-Cleveland-Akron Sign Company, The. Pole sign construction. 3,824,724, Cl. 40-125.00g.

Minegishi, Hiroshi, to Nippon Piston Ring., Ltd. and Toyo Kogyo Company Limited. Process for producing an oil seal to be applied to the rotary piston engine. 3,824,662, Cl. 29-156.600.

Mineri, Pasquale P., to Tenneco Chemicals, Inc. N¹-(Substituted ethyl) indazoles. 3,825,556, Cl. 260-310.00c.

Minnesota Mining & Manufacturing Company: *See—*
Bradford, Robert S.; Richardson, Harvey J.; Dubbe, Richard F.; and Ebbinga, Richard D., 3,825,675.

Minnesota Mining and Manufacturing Company: *See—*
Kurka, Kurt A., 3,825,430.

Mino, Hiroshi; and Yano, Satoshi, to Toyo Kogyo Company, Ltd. Method of removing core form diecasting. 3,825,055, Cl. 164-132.000.

Minovitch, Michael A., to Phaser Telepropulsion, Inc. Laser rocket. 3,825,211, Cl. 244-1.0sb.

Miraldi, Floro D. Scintillation crystal. 3,825,758, Cl. 250-366.000.

Miranker, Samuel H., to Automatic Steam Products Corp. Seambuster iron. 3,824,719, Cl. 38-77.300.

Misnik, Jury Mikhailovich: *See—*
Nekrasov, Lev Borisovich; Misnik, Jury Mikhailovich; Tsukernik, Zolya Samuilovich; Kriger, Semen Davidovich; and Kilkeev, Renat Shakhimardanovich, 3,824,718.

Mitchell, Robert D.: *See—*
Lee, Robert G.; and Mitchell, Robert D., 3,825,414.

Mitsubishi Chemical Industries Limited: *See—*
Matsuzawa, Katsuto; Matukuma, Akira; Takagishi, Iwao; and Yoshida, Kenji, 3,825,604.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Farrell, Greg; Tsuji, Akira; Hasimoto, Dojun; Koto, Nobuhisa; and Hirai, Nobutake, 3,825,679.
Saito, Nagao; Kobayashi, Kazuhiko; and Takagi, Shigeru, 3,825,715.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Hayase, Masao; Hayasaka, Yoshiyuki; and Araki, Yozo, 3,825,750.
Ujiie, Akira, 3,825,054.

Mitsubishi Paper Mills, Ltd.: *See—*
Futaki, Kiyoshi; and Motoki, Masaya, 3,825,432.

Mitsui Petrochemical Industries, Ltd.: *See—*
Wada, Shigeru; Oi, Hidesaburo; Matsuzawa, Norio; and Nishimura, Hiroshi, 3,825,524.
Wata, Tadao; Yusawa, Motoyasu; and Sasaki, Juntaro, 3,825,523.

Miura, Takashi; Sugiura, Takashi; and Iyoda, Yoshizi, to Sintokogio, Ltd. Mold prepared by vacuum sealed molding process. 3,825,058, Cl. 164-253.000.

Miyake, Makoto: *See—*
Akamatsu, Takashi; Koga, Koichi; Kondo, Mitsuru; Miyake, Makoto; and Iwasaki, Hiroshi, 3,825,561.

Miyamoto, Mitsunori: *See—*
Katsumata, Mitsuo; Miyamoto, Mitsunori; and Shirai, Kiyoshi, 3,824,976.

Miyazato, Takanori; Nakayama, Keiichi; and Fujii, Masao, to Kabushiki Kaisha Hattori Tokeiten. Control system for a traffic signalling apparatus. 3,825,890, Cl. 340-40.000.

Mizuno, Masayuki: *See—*
Takeda, Isao; Mizuno, Masayuki; Sugawara, Toshiaki; Shimojima, Yukiji; and Horiguchi, Sadayuki, 3,825,660.

Mizushiro, Ken: *See—*
Izawa, Shinichi; Harada, Kazuhiko; Mizushiro, Ken; Ishihara, Miyoko; and Nakanishi, Atsuo, 3,825,521.

Mizutani, Yoshiyuki; and Tozawa, Katutoshi, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Self-lubricating iron base alloy. 3,825,416, Cl. 75-123.0aa.

Mo, Olav. Platform structure. 3,824,795, Cl. 61-46.500.

Mo, Olav. Drilling platform. 3,824,943, Cl. 114-.50d.

Mobil Oil Corporation: *See—*
Braid, Milton, 3,825,496.
Givens, Wyatt W., 3,825,753.
Hagar, James L.; and Schwartz, Harold E., Jr., 3,824,851.
Johnston, Byron E., 3,825,605.
Miale, Joseph N., 3,825,486.

Moehlenpah, Walter G. Method of and apparatus for fabricating wood structures. 3,824,919, Cl. 100-35.000.

Molleman, Johan Henri: *See—*
Kjos, Magne Jarle; and Molleman, Johan Henri, 3,825,203.

Mollura, Carlos A. Tubular flexible bag with lap welded ends. 3,825,172, Cl. 229-5.500.

Monark-Crescent AB: *See—*
Johansson, Sture Ragnar; and Carlsson, Hilding Ake Gerry, 3,825,397.

Monocab, Inc.: *See—*
Dow, Ronald C., 3,825,915.

Monpetit, Louis, to Societe des Procedes Modernes d'Injection Sopromi. Electrical transducer. 3,824,863, Cl. 73-517.00a.

Monroe Belgium N.V.: *See—*
van den Berg, Johan H.; and van Eekelen, Alex H. A., 3,824,648.

Monsanto Company: *See—*
Ford, Emory A., 3,825,621.
Markhart, Albert H.; and Santer, James O., 3,825,511.

Monsanto Research Corporation: *See—*
Parts, Leo P.; and Miller, John T., Jr., 3,825,520.

Montgomery, William Lloyd, to Bell Telephone Labortories, Incorporated. Pulse code modulation code conversion. 3,825,924, Cl. 340-347.0dd.

Moon, Francis A.; and Halliday, Robert G., to Unimasco, Inc. Painting of interrupted lines on road surfaces. 3,825,185, Cl. 239-150.000.

Moore, Derek Stanley, to Vickers Limited. Optical devices. 3,825,343, Cl. 356-156.000.

Moore, Donald Fergus: *See—*
Samuel, Duncan Roy; and Moore, Donald Fergus, 3,825,025.

Moore, Gordon E., to Intel Corporation. Method of a semiconductor device wherein film cracking is prevented by formation of a glass layer. 3,825,442, Cl. 117-212.000.

Moore, Robert A.: *See—*
Klein, Gerald I.; Moore, Robert A.; and Payer, Stephen F., 3,825,859.

Morault, Gabriel. Apparatus for the injection of plastic materials. 3,825,155, Cl. 222-146.0hc.

Moret, Bernard; and Dufetele, Jean-Louis, to l'Air Liquide and Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Method and apparatus for continuously removing burrs from objects. 3,824,739, Cl. 51-9.000.

Morgardshammar Aktiebolag: *See—*
Bock, Nils Erik, 3,824,831.

Morgardshommar Aktiebolag: *See—*
Bennet, Tom Joachim; Nordstroem, Knut Lennart; and Polhaell, Karl Olof, 3,824,830.

Mori, Takasi; Takaku, Sakae; Suzuki, Seikichi; and Tsuda, Minoru, to Chugai Seiyaku Kabushiki Kaisha. Mycophenolic acid derivatives thereof. 3,825,571, Cl. 260-343.300.

Mori, Yoichi; Okazaki, Nobuo; Otsuka, Kunio; and Iijima, Tetsuya, to Nissan Motor Company, Limited. Gear train with three planertary gear sets. 3,824,876, Cl. 74-759.000.

Morimoto, Hiroshi; Watanabe, Masazumi; and Imada, Isuke, to Takeda Chemical Industries, Ltd. 4-Hexenoic compounds. 3,825,584, Cl. 260-484.00r.

Morin, Leo G., to Medico Electronic Inc., mesne. Reagent and method for bilirubin determination. 3,825,411, Cl. 23-230.00b.

Moriyama, Inao; and Toyama, Masamichi, to Canon Kabushiki Kaisha. Release switch device for a camera. 3,825,941, Cl. 354-266.000.

Morris, William F., Jr. Cube ice storage bin with distuber bars. 3,825,158, Cl. 222-238.000.

Morrise, Jesard: *See—*
Peterson, C. Lynn; and Morrise, Jesard, 3,825,125.

Morrison, Robert A.; and Wagner, John E. Hinge hanger. 3,825,127, Cl. 211-96.000.

Morrow, Duane Lloyd: *See—*
Wirt, Leslie Spencer; and Morrow, Duane Lloyd, 3,824,842.

Morrow, Margaret K.: *See—*
Duerksen, Walter K.; Holcombe, Cressie E., Jr.; and Morrow, Margaret K., 3,825,653.

Morton, Harvey L.; and Oland, Bradley H., to Tinsley Laboratories, Inc. Light source with high efficiency light collection means. 3,825,741, Cl. 240-41.00r.

Morton, Ralph B.: *See—*
Frye, James A.; and Morton, Ralph B., 3,825,230.

Mosch, Willi; Lutz, Gerhard; and Martin, Heinz, to Siemens Aktiengesellschaft. Method of making semiconductor component with sheet metal connector leads. 3,824,679, Cl. 29-588.000.

Moseman, Lawrence E.: *See—*
Kennard, Thomas J.; and Moseman, Lawrence E., 3,825,255.

Moss, Richard Wallace: *See—*
Birchfield, Jerry Linward; and Moss, Richard Wallace, 3,825,842.

Motoki, Masaya: *See—*
Futaki, Kiyoshi; and Motoki, Masaya, 3,825,432.

Motorola, Inc.: *See—*
Black, James R.; and Mattox, Robert J., 3,825,453.
Bowman, John L., 3,824,982.
Braun, William V., 3,825,829.
Finger, Carl; and Pausche, John W., 3,825,878.
Linder, Donald L., 3,825,849.
O'Connor, William W., 3,825,830.
Schoeff, John A., 3,825,450.
Schoeff, John A., 3,825,451.

Moync, Paul, to Rhone-Poulenc S.A. Apparatus for the batch treatment of solid material. 3,824,703, Cl. 34-130.000.

MuCulloch Corporation: *See—*
Brooks, John Hawley, 3,824,867.

Mueller, Richard: *See—*
Uhl, Guenter; Oppenlaender, Knut; Fikentscher, Rolf; and Mueller, Richard, 3,825,431.

Mueller, Rudolph C.: *See—*
Hyosaka, Alfred M.; and Mueller, Rudolph C., 3,824,954.

Muenger, James R., to Texaco Inc. Exothermic reaction process. 3,825,501, Cl. 252-373.000.

Mukai, Kunio: *See—*
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Okuno, Yositosi; Ogawa, Taizo; Wakatsuki, Toshiyuki; and Nishizawa, Yoshihiko, 3,825,633.

Mullan, Noel Austin; and Overell, Brian George, to Beecham Group Limited. Allergens reacted with carbodiimides. 3,825,525, Cl. 260-112.00r.

Mullender, Gernot F. Production of pipe bend sheaths. 3,825,412, Cl. 29-180.0ss.

Muller, Hans-Martin: *See—*
Schneider, Rolf; and Muller, Hans-Martin, 3,824,966.

Muller, Jean Claude, to Massey-Ferguson Services N.V. Belt drives. 3,824,864, Cl. 74-2.15r.

Muller, Josef: *See—*
Kaiser, Paul; Kaiser, Hans; and Muller, Josef, 3,824,889.

Muller, Werner; and Schmalz, Paul, to Muller-Schlenker. Battery-operated miniature alarm clock. 3,824,789, Cl. 58-19.00r.

Muller, Wolfgang: *See—*
Fruth, Hans; and Muller, Wolfgang, 3,825,084.

Muller-Schlenker: *See—*
Muller, Werner; and Schmalz, Paul, 3,824,789.

Murakami, Keiichi; Hoshi, Hiroshi; Hirakawa, Michio; and Susuki, Rinnosuke, to Lion Fat and Oil Company, Ltd. Process for preparing hexagonal system prismatic calcium sulfite. 3,825,656, Cl. 423-512.000.

Murata, Kingo; and Wakabayashi, Kaoru, to Kabushiki Kaisha Koparu. Operating mechanism for twenty four hour cycle digital timer. 3,825,702, Cl. 200-35.00r.

Murayama, Naohiro; and Fukuda, Makoto, to Kureha Kagaku Kogyo Kabushiki Kaisha. Molding composition containing polyethylene and cement. 3,825,519, Cl. 260-42.130.

Murphy, David M., to David Manufacturing Company. House trailer hook-up. 3,825,089, Cl. 180-12.000.

Murphy, Prescott V., to Standard Tool & Manufacturing Co. Chain drive having pivoted drive teeth. 3,824,869, Cl. 74-243.00r.

Murphy, Robert P.; and Froning, H. Robert, to Amoco Production Company. Log-injected-log system. 3,825,752, Cl. 250-258.000.

Murray, Brian Desmond Allan, to Normalair-Garrett (Holdings) Limited. High speed rotating machines. 3,825,311, Cl. 308-36.300.

Murry, Edward J., to Fibra-Sonics, Inc. Ultrasonic band transmission, focusing, measuring and encoding systems. 3,825,887, Cl. 340-15.000.

Muth, Karl: *See—*
Weber, Helmut; Aumuller, Walter; Weyer, Rudi; Muth, Karl; and Schmidt, Felix Helmut, 3,825,665.

Myers, Jimmy D., to Caterpillar Tractor Company. Adjustable stabilizer support for vehicles. 3,825,280, Cl. 280-150.500.

Myers, Thomas Elmar. Method of cutting hair. 3,825,020, Cl. 132-7.000.

Myrick, Floyd J.: *See—*
Green, B. Sherman; Green, Charles K.; Glancy, Jack L.; Myrick, Floyd J.; Norlander, Carl William; and Smith, Rodney E., 3,824,916.

Nadeau, Clarence S. Manually operable pivot pin for a wrist watch band. 3,824,783, Cl. 58-88.0sc.

Naefe, Gerhard: *See—*
Soldner, Richard; and Naefe, Gerhard, 3,824,988.

Nagano, Toshihiro; Suzuki, Mastsuo; Sano, Yoshio; Aoshima, Yasuo; and Suzuki, Shozo, to Riken Light Metal Industrics Co., Ltd. Finish dip painting device of metal works on mass production basis. 3,824,952, Cl. 118-56.000.

Nagaoka, Noriyoshi; and Usui, Genichi, to Nippon Kokan Kabushiki Kaisha. Method of rapidly determining the solidus line of molten steel. 3,824,837, Cl. 73-17.00r.

Nagel, Dietmar: *See—*
Pitkanen, Alan R.; Kennedy, Melvin R.; Nagel, Dietmar; Gross, William J.; and Bosley, Denis V., 3,825,265.

Nagoya Metallic Card Clothing Co., Ltd.: *See—*
Watanabe, Moriichi, 3,824,650.

Naig, Charley B. Support bracket. 3,824,959, Cl. 119-20.000.

Naito, Taketosi; and Ito, Masatomo, to Showa Denko Kabushiki Kaisha. Process for preparation of N,N-dialkyl toluamide. 3,825,596, Cl. 260-558.00r.

Nakamoto, Soichi: *See—*
Watanabe, Hiroaki; and Nakamoto, Soichi, 3,825,942.

Nakamura, Bungo: *See—*
Yamato, Yukio; Terada, Koki; and Nakamura, Bungo, 3,824,935.

Nakamura, Kihei; Yamazaki, Harumichi; Masuda, Hirotsugu; Sato, Takeshi; and Kiuchi, Yoshinori, to Bridgestone Tire Company Limited. Shock absorber for automobile bumpers. 3,825,292, Cl. 293-71.00r.

Nakamura, Toshihiko, to Nihon Filter Co., Ltd. Red-ox potentiometer provided with a PH correction circuit. 3,825,483, Cl. 204-195.00r.

Nakamura, Yukinobu: *See—*
Ohtsu, Takawo; Nakamura, Yukinobu; and Sekido, Fujihiko, 3,824,838.

Nakanishi, Atsuo: *See—*
Izawa, Shinichi; Harada, Kazuhiko; Mizushiro, Ken; Ishihara, Miyoko; and Nakanishi, Atsuo, 3,825,521.

Nakano, Toshihiko: *See—*
Ojima, Tadato; Koiso, Kazuhiro; and Nakano, Toshihiko, 3,825,877.

Nakata, Kazuhiko: *See—*
Kobayashi, Hiromasa; Oguchi, Yuzo; and Nakata, Kazuhiko, 3,825,950.

Nakauchi, Shunsaku; and Hirasawa, Masanori, to Tokyo Magnetic Printing Co., Ltd. Magnetic card reader. 3,825,728, Cl. 235-61.11d.

Nakayama, Keiichi: *See—*

Miyazato, Takanori; Nakayama, Keiichi; and Fujii, Masao, 3,825,890.

Narayanan, Venkatachala Lakshmi: *See—*
Haugwitz, Rudiger D.; and Narayanan, Venkatachala Lakshmi, 3,825,537.

Narco Scientific Industries, Inc.: *See—*
Smith, John F., 3,825,851.

Naruchi, Tatsuyuki: *See—*
Fujita, Yutaka; Naruchi, Tatsuyuki; Honda, Yuitsu; Ishimaru, Kenji; and Yoshisato, Eishin, 3,825,570.

Nasby, Charles L., Jr. Mobile dock structure. 3,824,796, Cl. 61-48.000.

National Advertising Company: *See—*
Schubert, Wilfried, 3,824,726.

National Cash Register Company, The: *See—*
Maierson, Theodore, 3,825,640.
Phillips, Paul S., Jr., 3,825,467.

National Engineering Company: *See—*
Kauffman, John H., 3,825,190.

National Recreation Industries, Inc.: *See—*
Weinstein, Burton Alan, 3,825,274.

National Research Development Corporation: *See—*
Kendler, Hayden Brian; Ripley, Lionel George; and Woollons, David John, 3,825,746.

National-Standard Company Limited: *See—*
Birch, Norman John, 3,824,775.

Navarro, Jose Ros. Collar ornament. 3,824,626, Cl. 2-145.000.

Nawata, Kiyoshi: *See—*
Ashida, Takao; Kurihara, Osamu; Nawata, Kiyoshi; Shinoki, Takanori; Fujita, Yutaka; Yamashita, Gentaro; and Saiki, Noritsugu, 3,825,508.

Neale, Charles O., to Voss, Josef, KG, Firma. Cylinder-lock. 3,824,818, Cl. 70-350.000.

Neary, Ralph E., to Schlage Lock Company. Lock indicator. 3,824,819, Cl. 70-432.000.

Needham, James M.: *See—*
Kasselmann, John T.; Hickner, George B.; Howard, Donald W.; and Needham, James M., 3,825,305.

Needleman, Stuart W.: *See—*
Halbich, Frank; and Needleman, Stuart W., 3,825,110.

Nekrasov, Lev Borisovich; Misnik, Jury Mikhailovich; Tsukernik, Zolya Samuilovich; Kriger, Semen Davidovich; and Kilkeev, Renat Shakhimardanovich. Excavator bucket with electromagnetic field weakening teeth. 3,824,718, Cl. 37-118.00r.

Nelson, Gerald V.: *See—*
Coons, William R., Jr.; Colvert, James H.; and Nelson, Gerald V., 3,825,485.

Nelson, Roger E.: *See—*
Levin, Berton P.; and Nelson, Roger E., 3,825,919.

Nelson, Roger E.; and Lucky, Clyde L., to Sierracin Corporation, The. Laminated security window system. 3,825,920, Cl. 340-274.000.

Neuman, Gordon E., to A-1 Engineering, Inc. Injection molding filter. 3,825,123, Cl. 210-232.000.

Neumunstersche Maschinen- und Apparatebau Gesellschaft mbH: *See—*
Bauch, Ernst, 3,824,656.

Neville, Richard E. G., to AMF Incorporated. Rotary dryer. 3,824,704, Cl. 34-134.000.

Nevin, Charles S.: *See—*
Drury, Raymond L., Jr.; Hines, James W.; and Nevin, Charles S., 3,825,514.

New Kon Industrial Co., Ltd.: *See—*
Otsuka, Katsumi, 3,825,179.

Newingham, Thomas D.; Recchuite, Alexander D.; Griffith, John Q., III; and Haseltine, Marcus W., Jr., to Sun Research and Development Co., mesne. Lubricant for controlled-slip differential. 3,825,495, Cl. 252-32.70e.

Newport News Shipbuilding & Dry Dock Company: *See—*
Huebner, H. Douglas, 3,824,845.

Nicholas, Stephen John. Servo-boosters for vehicle brake systems. 3,824,894, Cl. 91-369.00b.

Nicholson, James E.; and Lipson, Charles S., to Clinical Technology Incorporated. Pressure garment. 3,824,992, Cl. 128-24.00r.

Nicoll, Howard C. Reusable umbilical cord clamp for veterinary use. 3,825,012, Cl. 128-346.000.

Nielsen, Edward G.: *See—*
Roodvoets, Roger J.; and Nielsen, Edward G., 3,824,666.

Niepoth, George W.: *See—*
Cole, Edward N.; and Niepoth, George W., 3,824,788.

Nihon Denshi Kabushiki Kaisha: *See—*
Someya, Teruo; Kobayashi, Nobuyuki; and Goto, Toshinori, 3,825,839.

Nihon Filter Co., Ltd.: *See—*
Nakamura, Toshihiko, 3,825,483.

Nikolaevich, Robert: *See—*
Yakovlevich, Otari; Nikolaevich, Robert; Isidorovich, Ivan; and Georgievich, Mikhail, 3,825,718.

Nilsson, Stig Albert. Guiding device in a machine for manufacturing venetian blinds. 3,824,657, Cl. 29-24.500.

Nippon Carbureter Co. Ltd.: *See—*
Aoyama, Taizo; and Kamosawa, Katsuya, 3,825,237.

Nippon Electric Company, Limited: *See—*
Honma, Takamichi; Igarashi, Shigeru; and Harada, Hiroshi, 3,825,691.
Ishiguro, Tatsuo, 3,825,831.
Takahashi, Sakari, 3,825,455.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Okamoto, Shimaji, 3,825,668.

Nippon Kayaku Co., Ltd.: *See—*
Takenaka, Shigeo; Shimizu, Hitoshi; and Yamamoto, Kenichiro, 3,825,502.

Nippon Kokan Kabushiki Kaisha: *See—*
Nagaoka, Noriyoshi; and Usui, Genichi, 3,824,837.
Suga, Yoshizo, 3,825,405.

Nippon Petrochemicals Co., Ltd.: *See—*
Hirai, Kakichi; Hayashi, Hideo; and Hiratsuka, Yoichi, 3,825,624.

Nippon Piston Ring., Ltd.: *See—*
Minegishi, Hiroshi, 3,824,662.

Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See—*
Ohara, Takashi; Ueshima, Michio; and Yanagisawa, Isao, 3,825,600.

Nippon Toki Kabushiki Kaisha (Noritake Co., Ltd.): *See—*
Yoshikawa, Takayuki; Hisada, Eiichi; and Hujii, Tooru, 3,825,460.

Nishihara, Yoshio; and Ohashi, Isamu, to Mikuni Kogyo Kabushiki Kaisha. Overflow type carburetor. 3,825,238, Cl. 261-36.00a.

Nishimura, Hiroshi: *See—*
Wada, Shigeru; Oi, Hidesaburo; Matsuzawa, Norio; and Nishimura, Hiroshi, 3,825,524.

Nishizawa, Yoshihiko: *See—*
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Okuno, Yositosi; Ogawa, Taizo; Wakatsuki, Toshiyuki; and Nishizawa, Yoshihiko, 3,825,633.

Nissan Motor Company: *See—*
Kobayashi, Yasushi, 3,824,774.

Nissan Motor Company, Limited: *See—*
Mori, Yoichi; Okazaki, Nobuo; Otsuka, Kunio; and Iijima, Tetsuya, 3,824,876.
Saito, Shigeru, 3,824,665.
Yabuta, Keiichiro, 3,825,303.

Nisshin Steel Co. Ltd.: *See—*
Seki, Takeo; Kawamura, Shigenori; Maeda, Itsuji; and Kaneko, Akira, 3,825,351.

Nisula, Pentti Samuel, to Lannen Sokeri Oy. Device for the manufacture of peat band rolls. 3,825,199, Cl. 242-55.000.

Nobuo, Shirae, to Tiger Vacuum Bottle Industrial Company, Limited. Automatic liquid pouring device for vacuum bottle. 3,825,156, Cl. 222-183.000.

Nomarski, Georges; and Roblin,Gerard, to Etablissement Public: Agence Nationale de Valorisation de la Recherche (ANVAR). Process of optical path modulation and modulator for emplementation of the same. 3,825,348, Cl. 356-107.000.

Nomarski, Georges, to Etablissement Public: Agence Nationale de Valorisation de la Recherche Anvar. Point reference interferometry. 3,825,349, Cl. 356-107.000.

Noponen, Harold W.; and Miller, Tom B., to General Motors Corporation. Filler cap. 3,825,147, Cl. 220-44.00a.

Nordstroem, Knut Lennart: *See—*
Bennet, Tom Joachim; Nordstroem, Knut Lennart; and Polhaell, Karl Olof, 3,824,830.

Norick, William B.: *See—*
Erickson, Rodney R.; Hopkins, Donald L.; and Norick, William B., 3,825,287.

Norlander, Carl William: *See—*
Green, B. Sherman; Green, Charles K.; Glancy, Jack L.; Myrick, Floyd J.; Norlander, Carl William; and Smith, Rodney E., 3,824,916.

Normalair-Garrett (Holdings) Limited: *See—*
Murray, Brian Desmond Allan, 3,825,311.

Norquist, Bernard W. Portable centrifugal drier for small articles. 3,824,701, Cl. 34-58.000.

North American Rockwell Corporation: *See—*
Harris, Ronald E.; and Cullen, Darrel F., 3,824,678.

Norton, Charles J.; and Falk, David O., to Marathon Oil Company. Carboxy vinyl polymer and sulfonated alkyl acrylamide polymer mobility control agent and process. 3,825,068, Cl. 166-305.00r.

Norton, Charles J.; and Falk, David O., to Marathon Oil Company. Carboxy vinyl polymer and partially hydrolyzed polyacrylamide mobility control agent and process. 3,825,069, Cl. 166-305.00r.

Nosaki, Shigeki: *See—*
Kubota, Koji; Yoshihara, Yasuhiko; Hirakawa, Hayao; Kamijo, Hirotaka; Nosaki, Shigeki; Yoshinaga, Fumihiro; Okumura, Shinji; and Okada, Hiroshi, 3,825,472.

Nothen, Gunther: *See—*
Pohl, Siegfried; and Nothen, Gunther, 3,825,126.

Novello, Frederick C., to Merck & Co., Inc. 2-Hetero substituted 4 (3H)-quinazolinones. 3,825,542, Cl. 260-256.50r.

NSM-Apparatebau GmbH: *See—*
Menke, Wilhelm, 3,825,729.

Nudelman, Abraham; and McCaully, Ronald J., to American Home Products Corporation. N-carboxymethyl-n-substituted glycinate esters of 3-hydroxy-1,4-benzodiazepin-2-ones. 3,825,533, Cl. 260-239.30d.

Nutter, Benjamin P., to Schlumberger Technology Corporation. Pressure controlled test valve system for offshore wells. 3,824,850, Cl. 73-151.000.

Nutting Truck and Caster Company: *See—*
Biessener, Richard M., 3,824,930.

Obenhaus, Robert E., to Texas Instruments Incorporated. Computer input/output interface systems using optically coupled isolators. 3,825,896, Cl. 340-147.00r.

Ochi, Shikanosuke, to Kabushiki Kaisha Sega Enterprises. Device for simulating a running animal. 3,825,256, Cl. 273-1.00e.

O'Connor, William W., to Motorola, Inc. Offset oscillator system for radio transmitter and receiver. 3,825,830, Cl. 325-20.000.

Oconomowoc Mfg. Corporation: *See—*
Donahue, Jerome T.; Hess, Walter F.; Knoebel, Gordon W.; and Sydow, Donald E., 3,824,658.

O'Donnell, John R., to EG & G, Inc. Coaxial line to strip line connector. 3,825,861, Cl. 333-33.000.

Oehninger, Jurg, to Sulzer Brothers Limited. Apparatus for the storage of elongate material. 3,825,198, Cl. 242-55.000.

Oestmann, Eldon D.: *See—*
Krolak, Ronald L.; and Oestmann, Eldon D., 3,825,309.

Ogawa, Masaya, to Matsushita Seiko Company, Limited. Surface exposure device for copying apparatus. 3,825,339, Cl. 355-51.000.

Ogawa, Taizo: *See—*
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Okuno, Yositosi; Ogawa, Taizo; Wakatsuki, Toshiyuki; and Nishizawa, Yoshihiko, 3,825,633.

Oguchi, Yuzo: *See—*
Kobayashi, Hiromasa; Oguchi, Yuzo; and Nakata, Kazuhiko, 3,825,950.

Ohara, Takashi; Ueshima, Michio; and Yanagisawa, Isao, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Process for the preparation of unsaturated carbonyl compounds. 3,825,600, Cl. 260-604.00r.

Ohashi, Isamu: *See—*
Nishihara, Yoshio; and Ohashi, Isamu, 3,825,238.

Ohmae, Tadayuki: *See—*
Sonoda, Ryuichi; and Ohmae, Tadayuki, 3,825,610.

Ohsawa Manufacturing Co., Ltd.: *See—*
Ohsawa, Yoichi, 3,825,189.

Ohsawa, Yoichi, to Ohsawa Manufacturing Co., Ltd. Burner valve nozzle arrangement for liquid gas lighter. 3,825,189, Cl. 239-590.000.

Ohtsu, Takawo; Nakamura, Yukinobu; and Sekido, Fujihiko, to Japan Gasoline Co., Ltd. Process gas chromatographic apparatus. 3,824,838, Cl. 73-23.100.

Oi, Hidesaburo: *See—*
Wada, Shigeru; Oi, Hidesaburo; Matsuzawa, Norio; and Nishimura, Hiroshi, 3,825,524.

Ojima, Tadato; Koiso, Kazuhiro; and Nakano, Toshihiko, to Matsushita Electric Industrial Company, Limited. Printed circuit assembly and method for fabrication thereof. 3,825,877, Cl. 339-17.00c.

Oka, Atsutaka, to Yuasa Battery Company Limited. Lead-zinc primary battery. 3,825,446, Cl. 136-114.000.

Okada, Hiroshi: *See—*
Kubota, Koji; Yoshihara, Yasuhiko; Hirakawa, Hayao; Kamijo, Hirotaka; Nosaki, Shigeki; Yoshinaga, Fumihiro; Okumura, Shinji; and Okada, Hiroshi, 3,825,472.

Okamoto, Shimaji, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument capable of providing a third type of musical tones by operation of two keyboards in addition to the ordinary melody and chord tones. 3,825,668, Cl. 84-1.170.

Okazaki, Nobuo: *See—*
Mori, Yoichi; Okazaki, Nobuo; Otsuka, Kunio; and Iijima, Tetsuya, 3,824,876.

Okumura, Shinji: *See—*
Kubota, Koji; Yoshihara, Yasuhiko; Hirakawa, Hayao; Kamijo, Hirotaka; Nosaki, Shigeki; Yoshinaga, Fumihiro; Okumura, Shinji; and Okada, Hiroshi, 3,825,472.

Okuno, Yositosi: *See—*
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Okuno, Yositosi; Ogawa, Taizo; Wakatsuki, Toshiyuki; and Nishizawa, Yoshihiko, 3,825,633.

Oland, Bradley H.: *See—*
Morton, Harvey L.; and Oland, Bradley H., 3,825,741.

Olin Corporation: *See—*
Gay, Walter A.; and Gavin, David F., 3,825,581.
Reilly, Dennis E., 3,825,443.

Oliveto, Eugene Paul: *See—*
Hajos, Zoltan George; and Oliveto, Eugene Paul, 3,825,569.

Olsen, Frederick C.: *See—*
Paramonoff, Elpidifor; Olsen, Frederick C.; and Labeda, Robert C., 3,825,270.

Olsen, Robert Nils: *See—*
Lucas, Howard Robert; and Olsen, Robert Nils, 3,825,515.

Olsson, Sven-Gunnar Sigvard, to Siemens Aktiengesellschaft. Device for producing gas flows. 3,824,902, Cl. 92-40.000.

Omark Industries, Inc.: *See—*
Hughes, James S., Jr., 3,825,717.

O.M.V. S.p.A.: *See—*
Padovani, Pietro, 3,825,166.

O'Neill, Gerald J.; Simons, Charles W.; and Billings, Charles A., to Grace, W. R. & Co. Fluorocyclopropanes as inhalation anesthetics. 3,825,606, Cl. 260-648.00f.

Ono, Yoshio; Sekine, Chiu; Takaoka, Naotoshi; and Asai, Nobuyoshi, to Takamatsu Electric Works Ltd. Fuse element and a high voltage current-limiting fuse. 3,825,870, Cl. 337-159.000.

Onufer, George R.: *See—*
Beller, Herbert R.; and Onufer, George R., 3,824,791.

Ooba, Shigehiro: *See—*
Fujimoto, Keimei; Hirano, Masachika; Takeda, Hisami; and Ooba, Shigehiro, 3,825,579.

Oppenlaender, Knut: *See—*
Uhl, Guenter; Oppenlaender, Knut; Fikentscher, Rolf; and Mueller, Richard, 3,825,431.

Orb, Inc.: *See—*
Wisotsky, Serge S., 3,824,797.

Ordena Lenina Fizichesky Institut Imeni P.N. Lebedeva: *See—*
Kozlov, Stanislav Fedorovich; and Konorova, Elena Laexandrovna, 3,824,680.

Ormerod, Philip Austin, to Imperial Chemical Industries Limited. Weft selecting apparatus. 3,825,038, Cl. 139-122.00w.

Orr, John L., to Keystone Consolidated Industries, Inc. Removable cylinder lock. 3,824,817, Cl. 70-81.000.

Ortho Pharmaceutical Corporation: *See—*
Karmas, George, 3,825,576.

Ortloff, Gerald D.: *See—*
Lloyd, James R.; Williams, Robert E.; Bayless, Jack H.; Ortloff, Gerald D.; and Bruce, George H., 3,825,065.

Osborne, Thomas E., to Hewlett-Packard Company. Calculator with provision for efficiently manipulating factors and terms. 3,825,736, Cl. 235-168.000.

Osburn, John G.; and Schachte, John J., to Kearney & Trecker Corporation. Workpiece changer mechanism for a machine tool. 3,825,245, Cl. 269-30.000.

Osta, Francesco. Device for controlling the launching of a reel of web in an unwinder with automatic reel change. 3,825,201, Cl. 242-58.100.

Otsuka, Katsumi, to New Kon Industrial Co., Ltd. Electric mark perforator. 3,825,179, Cl. 234-51.000.

Otsuka, Kunio: *See—*
Mori, Yoichi; Okazaki, Nobuo; Otsuka, Kunio; and Iijima, Tetsuya, 3,824,876.

Ott, Owen J.; Ginn, David W.; and Miller, Lester F., Jr., to Data Interface, Inc. Toner applicator for magnetic printing system. 3,825,936, Cl. 346-74.0mp.

Otto, Carl L. Electrically powered submerged pump, power circuit therefor, and oceanographic monitoring apparatus and method employing same. 3,824,852, Cl. 73-170.00a.

Otto Engineering, Inc.: *See—*
Roeser, John O., 3,825,723.

Overell, Brian George: *See—*
Mullan, Noel Austin; and Overell, Brian George, 3,825,525.

Owen, Harold D. Step assembly apparatus for use on ski boat or the like. 3,825,097, Cl. 182-91.000.

Owen, Thomas G., Jr. Pivotable refuse cart dumping apparatus with horizontally movable and spreadable arms. 3,825,133, Cl. 214-148.000.

Owens-Corning Fiberglas Corporation: *See—*
Finn, Lawrence R.; and Smith, Richard L., 3,824,759.
Kies, Jared R., 3,825,642.
Marzocchi, Alfred, 3,824,779.

Owens-Illinois, Inc.: *See—*
Amberg, Ralph G., 3,824,840.
Aust, John J.; and Gray, Charles D., 3,825,170.
Kontz, Robert F., 3,825,396.
Wojcik, Gerald E.; and Lawson, William M., 3,825,468.

Oxy Metal Finishing Corporation: *See—*
Clauss, Richard J.; Tomaszewski, Thaddeus W.; and Brown, Henry, 3,825,478.

Ozaki, Toshiaki: *See—*
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Okuno, Yositosi; Ogawa, Taizo; Wakatsuki, Toshiyuki; and Nishizawa, Yoshihiko, 3,825,633.

Pac-Craft Products, Inc.: *See—*
Clark, Albert L., 3,825,095.

Paccar Inc.: *See—*
Saunders, James W.; and Stephens, Donald L., 3,825,295.

Padovani, Pietro, to O.M.V. S.p.A. Container having an open top surrounded by a lip. 3,825,166, Cl. 229-1.50b.

Paige, Anthony Thomas, to Amalgamated Dental Company, The. Cartridge syringe and crimped needle assembly. 3,825,002, Cl. 128-218.0da.

Pallos, Ferenc M.; Lee, Hwalin; and Menn, Julius J., to Stauffer Chemical Company. Certain geranyl phenyl ethers and their epoxides and their use in controlling insects. 3,825,602, Cl. 260-609.00r.

Pallos, Ferenc M., to Stauffer Chemical Company. Phosphorus-containing amidines. 3,825,632, Cl. 260-944.000.

Palmer, George L. Apparatus for practicing basketball throws. 3,825,257, Cl. 273-1.50a.

Papiau, Guy, to Societe Anonyme D.B.A. Fluid pressure unbalance indicator with plural pistons. 3,825,706, Cl. 200-82.00d.

Paquette, Richard N.: *See—*
Winfield, Merle, 3,824,978.

Par-Way Mfg. C.: *See—*
Doering, Beauford C., 3,825,188.

Parady, Victor G., Jr., to Sea-Land Service, Inc. Livestock container. 3,824,958, Cl. 119-10.000.

Paramonoff, Elpidifor; Olsen, Frederick C.; and Labeda, Robert C., to Standum, Inc. Wiper seal for apparatus such as metallic can body formers. 3,825,270, Cl. 277-15.000.

Parkinson, James R. Two sensor torque measuring apparatus with compensation for shaft misalignment. 3,824,848, Cl. 73-136.00a.

Parts, Leo P.; and Miller, John T., Jr., to Monsanto Research Corporation. Smoke-retardant styrene polymer compositions containing a metal phthalocyanine. 3,825,520, Cl. 260-45.75r.

Passien, Renold R. Magnetic discboard. 3,825,927, Cl. 340-373.000.

Patel, Arvind M.: *See—*
Bossen, Douglas C.; Hong, Se J.; Hsiao, Mu-Yue; and Patel, Arvind M., 3,825,893.

Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH: *See—*
Pfaue, Johannes; and Schmidt, Jochen, 3,825,788.

Patrick, Bruce R.; and Timms, Herbert, to Timms, Herbert W. Solid state automatic fluid dispensing means. 3,825,153, Cl. 222-14.000.

Patrick, Ralph R.; Kmecak, Ronald A.; and Kovach, Stephen M., to Ashland Oil, Inc. Hydrogen transfer catalyst. 3,825,503, Cl. 252-462.000.

Patterson, Charles B.: *See—*
Fisher, William T.; Patterson, Charles B.; and Dahl, Stanley M., 3,824,923.

Pauliukonis, Richard S. Energy conserving directional valve-cylinder combination. 3,824,898, Cl. 91-416.000.

Pausche, John W.: *See—*
Finger, Carl; and Pausche, John W., 3,825,878.

Paxton, Thomas R.: *See—*
Berens, Alan R.; and Paxton, Thomas R., 3,825,434.

Payer, Stephen F.: *See—*
Klein, Gerald I.; Moore, Robert A.; and Payer, Stephen F., 3,825,859.

Pecorari, Piercelestino. Apparatus for transporting and mixing concrete. 3,825,232, Cl. 259-177.00r.

Pelly, Brian R., to Westinghouse Electric Corporation. Active filter for the input harmonic current of static power converters. 3,825,814, Cl. 321-9.00a.

Pelofsky, Arnold H.; Felix, Dan T.; and Herbert, Gary N. Sonic energy exhaust filter. 3,825,480, Cl. 204-193.000.

Pelosi, Michael H., Jr.: *See—*
Horneff, James P.; and Pelosi, Michael H., Jr., 3,824,909.

Peng, Yao, to Avco Corporation. Cooled turbine rotor cylinder. 3,825,365, Cl. 415-117.000.

Penicaud, Etienne, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Conversation detector for a telephonic channel concentrator. 3,825,694, Cl. 179-15.0as.

Pennwalt Corporation: *See—*
Tuccillo, Joseph J., 3,825,419.

Pepe, Anthony Enrico, to Stauffer Chemical Company. Curable organ opolysiloxanes. 3,825,618, Cl. 260-827.000.

Peripherals General, Inc.: *See—*
Peterman, Neil R.; Korn, Darryl K.; and Millard, Stephen, 3,825,844.

Perkins, Jerry K.: *See—*
Wickam, Irwin Edward; and Perkins, Jerry K., 3,825,106.

Perrella, Donald J.; and Dolfini, Joseph E., to Squibb, E. R., & Sons, Inc. Bis-cephalasporins. 3,825,536, Cl. 260-243.00c.

Peruglia, Marco, to FIAT Societa per Azioni. Automatic unidirectional throttle. 3,825,032, Cl. 137-496.000.

Pester, William B.: *See—*
Holland, Andrew M.; and Pester, William B., 3,825,268.

Peterman, Neil R.; Korn, Darryl K.; and Millard, Stephen, to Peripherals General, Inc. System for recovering phase shifted data pulses. 3,825,844, Cl. 329-104.000.

Petersen, Carsten Georg Otto; and Giversen, Svend, to Danfoss A/S. Valve arrangement for fluid pressure motor or pump. 3,825,376, Cl. 418-61.00b.

Peterson, C. Lynn; and Morrise, Jesard, to Peterson Filters and Engineering Company. Filter and guide apparatus. 3,825,125, Cl. 210-401.000.

Peterson Filters and Engineering Company: *See—*
Peterson, C. Lynn; and Morrise, Jesard, 3,825,125.

Peterson, Kenneth L., to Anderson Corporation. Apparatus and method for reducing the occurrence of bowing in wooden window rails. 3,825,046, Cl. 144-142.000.

Peterson, Stuart R. Anti-glare system for motor vehicles. 3,825,296, Cl. 296-97.00d.

Petigara, Ramesh B.: *See—*
Yale, Harry Louis; and Petigara, Ramesh B., 3,825,549.

Petitgout, George L.: *See—*
Darges, Walter; Karpis, John J.; Petitgout, George L.; and Witbeck, Walter G., 3,825,212.

Petrant, Robert G. Multi-purpose work holding means. 3,824,744, Cl. 51-217.00a.

Petrofina Canada Ltd.: *See—*
Redford, David Arthur, 3,825,066.

Petrova, Nina Vladimirovna. Charging pipe union. 3,825,222, Cl. 251-149.600.

Petty, Albert W.: *See—*
Matthews, Robert M.; and Petty, Albert W., 3,824,812.

Peverill, William J., to International Telephone and Telegraph Corporation. Electrical connector. 3,825,874, Cl. 339-14.00r.

Pezot, Jacques, to Commissariat a l'Energie Atomique. Laser generator for single transverse mode operation. 3,825,856, Cl. 331-94.50c.

Pfaue, Johannes; and Schmidt, Jochen, to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH. High pressure metal vapor discharge lamp with tubular current lead including filler release construction. 3,825,788, Cl. 313-174.000.

Pfeiffer, John c. Device for testing semiconductors and other electrical components. 3,825,828, Cl. 324-158.00t.

Phaser Telepropulsion, Inc.: *See—*
Minovitch, Michael A., 3,825,211.

Philippaerts, Herman Adelbert: *See—*
Pollett, Robert Joseph; Philippaerts, Herman Adelbert; Vandenberghe, Antoon Leon; and Willems, Jozef Frans, 3,825,426.

Phillips, Paul Creighton, to RCA Corporation. Balanced line driver, line receiver system. 3,825,682, Cl. 178-69.00g.

Phillips, Paul S., Jr., to National Cash Register Company, The. Pressure-sensitive record sheet material. 3,825,467, Cl. 161-159.000.

Phillips Petroleum Company: *See—*
Chapman, Charles C., 3,825,616.
Erdman, J. Gordon, 3,824,858.
Farfaglia, Silvio T., 3,824,702.
Farfaglia, Silvio T.; and Halpin, Robert G., 3,825,408.
Henderson, Eulas W., 3,825,233.
Johnson, Lewis T.; and Bull, Willard E., 3,825,114.
MacEwan, George E., 3,825,168.

Phillips, Ralph E., Jr.: *See—*
Sadler, Keith A.; and Phillips, Ralph E., Jr., 3,825,872.

Phillips Retroleum Company: *See—*
Rostler, Fritz S., 3,825,513.

Phillips Screw Company: *See—*
Miller, Allan, 3,825,898.

Photo-Control Corporation: *See—*
Van Wandelen, Henri, 3,825,748.

Piccione, Nicholas E. System and apparatus for underground transformer installation. 3,825,866, Cl. 337-17.000.

Pichal, Henri T., to Honeywell Information Systems Inc. Amplifier with substantially zero distortion products. 3,825,854, Cl. 330-149.000.

Pichowicz, John R. Perma land bound stake device. 3,824,748, Cl. 52-103.000.

Piecuch, Richard Wm.: *See—*
Salerno, Paul G.; Sikorcin, John; and Piecuch, Richard Wm., 3,825,026.

Pietrowiak, Fritz. Installation for the manufacture of finished components. 3,825,394, Cl. 425-404.000.

Pilato, Louis A.: *See—*
Robeson, Lloyd M.; Pilato, Louis A.; and Godlewski, Robert E., 3,825,622.

Pinckaers, B. Hubert, to Honeywell Inc. Control system comprising differential amplifier with dual current comparator having two outputs separated by a deadband. 3,825,852, Cl. 330-30.00d.

Pipitone, Ralph M.: *See—*
Brown, Wendell W.; Davis, Michael I.; and Pipitone, Ralph M., 3,825,902.

Pipkins, David D., to Valspar Corporation, The. Container containing a carbonated product. 3,825,111, Cl. 206-84.000.

Pirchl, Gerhard, to Romay AG. Visual display apparatus with character matrix. 3,825,923, Cl. 340-336.000.

Pirhonen, Ilpo M. J.: *See—*
Forss, Kaj G.; and Pirhonen, Ilpo M. J., 3,825,526.

Piroth, Dieter: *See—*
Lubbers, Dietrich Werner; Wodick, Reinhard; and Piroth, Dieter, 3,825,342.

Pitkanen, Alan R.; Kennedy, Melvin R.; Nagel, Dietmar; Gross, William J.; and Bosley, Denis V., to Mattel, Inc. Amusement machine. 3,825,265, Cl. 273-126.00r.

Pitre, Davide: *See—*
Felder, Ernst; and Pitre, Davide, 3,825,591.

Pitroda, Satyan G.; and Rekiere, Bernard J., to GTE Automatic Electric Laboratories Incorporated. Line variation compensation system for synchronized PCM digital switching. 3,825,683, Cl. 178-69.50r.

Pitzalis, Mario: *See—*
Vargiu, Silvio; Giovanni, Sesto S.; and Pitzalis, Mario, 3,825,522.

Pivar, Stewart, to Rototron Corporation. Apparatus for molding hollow plastic articles. 3,825,395, Cl. 425-435.000.

Plessey Handel und Investments A.G.: *See—*
Beavitt, Alan Robert; and McCarthy, John Peter, 3,825,801.
Hilton, John Leslie, 3,824,669.

Plokhov, Viktor Ivanovich: *See—*
Starostin, Jury Stepanovich; Plokhov, Viktor Ivanovich; Erokhov, Veniamin Kuzmich; Ivanov, Vladimir Prokopievich; Krotkov, Vladimir Nikolaevich; Anisimov, Albert Viktorovich; Ajupov, Rustem Nurievich; and Golovinov, Mikhail Fedortovich, 3,824,832.

Pohl, Siegfried; and Nothen, Gunther, said Pohl, assor. to said Nothen, Gunther. Flower pot grate-tray. 3,825,126, Cl. 211-71.000.

Pokorny, William C. Transmission line audible noise and corona reducing device. 3,825,671, Cl. 174-40.00r.

Polaroid Corporation: *See—*
Reynolds, Robert, 3,825,335.
Reynolds, Robert, 3,825,336.

Polhaell, Karl Olof: *See—*
Bennet, Tom Joachim; Nordstroem, Knut Lennart; and Polhaell, Karl Olof, 3,824,830.

Pollett, Robert Joseph; Philippaerts, Herman Adelbert; Vandenberghe, Antoon Leon; and Willems, Jozef Frans, to Agfa-Gevaert N.V. Development of exposed photographic silver halide elements. 3,825,426, Cl. 96-76.00r.

Polysar Limited: *See—*
La Flair, Ronald Turner, 3,825,623.

Pommerening, Uwe A.: *See—*
Gueldenpfennig, Klaus; Pommerening, Uwe A.; and Russell, Stanley L., 3,825,692.

Pontello, Anthony P., to United States of America, Navy. Fuel filter testing apparatus. 3,824,823, Cl. 73-432.00r.

Pool, Stuart D., to Mathews, Bernard C. Unloader for the grain bin of a combine. 3,825,138, Cl. 214-522.000.

Popov, Vitaly Fedorovich. Gas fuel blowpipe for burning reaction gas mixtures. 3,825,400, Cl. 431-160.000.

Pott, Heinrich, to Siemag Siegener Maschinenbau G.m.b.H. Molding hollow articles. 3,825,389, Cl. 425-324.00b.

Poulain, Claude: *See—*
Kern, Rene; Poulain, Claude; and Tock, Francois, 3,825,532.

Powell, Charles W. Art sculpture. 3,824,712, Cl. 35-26.000.

Prada, Luis E., to General Electric Company. Combination ice cube and crushed ice dispenser selector means. 3,824,805, Cl. 62-320.000.

Preisler, Eberhard; Grapentin, Kurt; Harmsen, Ernst; and Harnisch, Heinz, to Knapsack Aktiengesellschaft. Production of manganese (II) salt solutions. 3,825,652, Cl. 423-50.000.

Preload Technology, Inc.: *See—*
Shelander, Charles, 3,824,751.

Presley, Robert W. Fish brooder or refuge. 3,824,956, Cl. 119-3.000.

Price Brothers Company: *See—*
Keyser, Lewis R., 3,825,037.

Price, Ralph E.; and Schoonover, Stanley C., to Landis Tool Company. Machine tool control system. 3,824,743, Cl. 51-165.07l.

Price, Ronald; and Kelemen, Jozsef W., to Leigh Instruments Limited. Scratch strain recorder. 3,825,934, Cl. 346-7.000.

Pritchard, David William; and Wiseman, Thomas James, to British Titan Limited. Manufacture of pigments. 3,825,438, Cl. 117-100.00b.

Procop, Alex J.; and Boultinghouse, Ace, to Target Systems Corporation. Projection lamp carrier. 3,825,331, Cl. 352-198.000.

Procter & Gamble Company, The: *See—*
Barbera, Melvin A., 3,825,588.
Buell, Kenneth B., 3,824,652.
Buell, Kenneth B., 3,825,194.

Produits Chemiques Ugine Kuhlmann: *See—*
Lalu, Jean-Pierre; and Foulletier, Louis, 3,825,577.

Prohaska, Hans: *See—*
Hanselmann, Dieter; and Prohaska, Hans, 3,825,707.

Protocol Engineering Limited: *See—*
Billows, Leonard Kay; and Gosling, Raymond John, 3,824,828.

Prouty, Robert E.; and Graf, Robert E., to Essex International, Inc. Electromagnetic relay. 3,825,865, Cl. 335-128.000.

Pugh, K. O.; Ivey, Howard; and Cobb, Austell C. A., to Ruralist Press, Inc. Laminated magnetic printing roll assembly. 3,824,927, Cl. 101-382.0mv.

Pugh, Robert E.: *See—*
Connor, John S.; and Pugh, Robert E., 3,825,766.

Puhahn, Werner, to Standardwerk Eugen Reis, GmbH. Mechanism for mounting roll paper. 3,825,200, Cl. 242-57.000.

Pullman Incorporated: *See—*
Carr, George W., 3,825,294.
Hutchison, John W., 3,824,931.

Pungs, Wolfgang: *See—*
Schneider, Johannes; and Pungs, Wolfgang, 3,825,516.

Purcell, Robert J.: *See—*
Stedman, Robert N.; and Purcell, Robert J., 3,825,074.

Pure Way Corporation: *See—*
Bach, Bert; and Lemcke, Robert, 3,824,632.

Purex Corporation, Ltd.: *See—*
Fisher, William T.; Patterson, Charles B.; and Dahl, Stanley M., 3,824,923.

Puzynya, Leonid Vasilievich: *See—*
Smirnov, Mikhail Dmitrievich; Ershov, Boris Alexandrovich; Savitsky, Vladilen Nikolaevich; Breev, Boris DmitrievICH; Atkarsky, Anatoly Alexandrovich; Shardakov, Svyatoslav Viktorovich; Sinajuk, David Aronovich; Stukalov, Vladimir Nikolaevich; and Puzynya, eonid Vasilievich, 3,824,642.

Pyles, Gerald Dee, to RCA Corporation. Delayed alarm and drowse for clock receivers. 3,825,836, Cl. 324-396.000.

Pyles, Gerald Dee, to RCA Corporation. Cartridge changer with cartridge sensing means. 3,825,949, Cl. 360-91.000.

Pylon, Incorporated: *See—*
Burns, Robert G., 3,824,721.

R. S. Reciprocating Trainer Enterprises, Inc.: *See—*
Soderberg, Raymond Henry, Sr., 3,824,994.

Radford, David L., to Vital Assists Inc. Blood port assembly and method. 3,825,492, Cl. 210-22.000.

Radun Controls Limited: *See—*
Samuel, Duncan Roy; and Moore, Donald Fergus, 3,825,025.

Rallis, Theodore. Toothbrush adapter for aerosol container. 3,825,354, Cl. 401-119.000.

Ralph Harold J. Diaper garment with interleaved liner having non-wicking protective panels. 3,825,006, Cl. 128-287.000.

Ralph, John Ernest, to U.S. Philips Corporation. Channel plate display device having positive optical feedback. 3,825,922, Cl. 340-324.00m.

Ramey, Robert M., to Teledyne, Inc. Submersible pool heater. 3,824,986, Cl. 126-360.000.

Ramsden, Paul S., Jr., to Sanders Associates, Inc. Surveillance system. 3,825,676, Cl. 178-6.800.

Ramstrom, Sven, to Karlskronavarvet AB. Aerial tuning device. 3,825,864, Cl. 334-39.000.

Rand, Robert W. Pledgets. 3,825,007, Cl. 128-296.000.

Rapid S.A.: *See—*
Duchatellier, Bernard Charles, 3,825,884.

Rappaport, Richard A., to Sybron Corporation. Digital system including a pulse counter for selectively interconnecting a source of energy and a plurality of energizeable elements. 3,825,841, Cl. 328-70.000.

Rarey, Kenneth W.; and Kennedy, John B., Jr., to Continental Can Company, Inc. Electrostatic screen printing and cleaning. 3,824,924, Cl. 101-114.000.

Rawson, Edward B.: *See—*
Worthington, Harvey R., Jr.; Rawson, Edward B.; and Schwarzkopf, Daniel, 3,825,730.

Raytheon Company: *See—*
Barrett, Harrison H.; and Horrigan, Frank A., 3,825,757.

RCA Corporation: *See—*
Ahmed, Adel Abdel Aziz, 3,825,778.
Amodei, Juan Jose, 3,825,316.
Belohoubek, Erwin Franz; and Stevenson, David Michael, 3,825,805.
Davidson, Edmund Benjamin, 3,825,428.
Dietz, Wolfgang Friedrich Wilhelm, 3,825,793.
Hampel, Daniel, 3,825,770.
Marinelli, Donald Paul; and Stockton, Thomas Edward, 3,825,449.
Phillips, Paul Creighton, 3,825,682.
Pyles, Gerald Dee, 3,825,836.
Pyles, Gerald Dee, 3,825,949.

Recchuite, Alexander D.: *See—*
Newingham, Thomas D.; Recchuite, Alexander D.; Griffith, John Q., III; and Haseltine, Marcus W., Jr., 3,825,495.

Redfern, John T., to United States of America, Navy. High-pressure optical bulkhead penetrator. 3,825,320, Cl. 350-96.00b.

Redford, David Arthur, to Petrofina Canada Ltd. Process for developing interwell communication in a tar sand. 3,825,066, Cl. 166-261.000.

Redington, Rowland W.; and Van Heerden, Pieter J., to General Electric Company. Photoconductive camera tube and methods of manufacture. 3,825,795, Cl. 315-10.000.

Reed, Norman D.: *See—*
Ligon, Elmer R.; and Reed, Norman D., 3,825,392.

Reichelt, Walter: *See—*
Bacal, Martha; and Reichelt, Walter, 3,825,790.

Reichhold Chemicals, Inc.: *See—*
Ficarra, Bartholomew M., 3,825,517.

Reilly, Dennis E., to Olin Corporation. Coiled tube blowout process and apparatus. 3,825,443, Cl. 134-24.000.

Reilly, James J.; and Wiswall, Richard H., Jr., to United States of America, Atomic Energy Commission. Alloys for isolation of hydrogen. 3,825,418, Cl. 75-159.000.

Reiter, William M.; Cooper, James E.; and Sheth, Krishnakant K., 1/2 to Sumitomo Chemical Company, Ltd. and 1/2 to Universal PVC Resins, Inc. Process for polymerizing vinyl chloride using a reflux condenser. 3,825,512, Cl. 260-92.80w.

Rekiere, Bernard J.: *See—*
Kelly, Michael J.; Kobylar, Alex W.; and Rekiere, Bernard J., 3,825,690.
Pitroda, Satyan G.; and Rekiere, Bernard J., 3,825,683.

Reliance Electric Company: *See—*
Jacobs, Norman H.; and Susor, William C., 3,825,734.
Martin, Orval J., 3,825,085.

Remane, Roger, to Societe Anonyme: "Application des Gaz.". Needle plug cock. 3,825,224, Cl. 251-205.000.

Renfrew, Andrew Hunter Morris: *See—*
Boyd, Violet; Evans, Ronald Arthur; Holt, Kenneth Anthony; and Renfrew, Andrew Hunter Morris, 3,825,507.

Rennick, Leonard E., to Sun Oil Company. Hydroformylation of internal olefins. 3,825,601, Cl. 260-604.0hf.

Rettedal, Cecil D. Golf ball picker and collector. 3,825,136, Cl. 214-350.000.

Reval, Hardev, to C.A.V. Limited. Thyristor chopper circuits. 3,825,817, Cl. 321-45.00c.

Rexon, George F.: *See—*
Bittner, Charles W.; and Rexon, George F., 3,825,393.

Reynolds, Delbert Daniel; and Cossar, Bernard Calvin, to Eastman Kodak Company. Oxazines and mono (secondary aminomethyl) hydroquinones and process for their preparation. 3,825,538, Cl. 260-244.00r.

Reynolds Metals Company: *See—*
Harrison, Maurice Clark; and Vancil, Donald Otis, 3,825,659.

Reynolds, Richard W., to Huck Finn, Inc. Beer keg. 3,825,145, Cl. 220-1.00r.

Reynolds, Robert, to Polaroid Corporation. Variable color photographic lighting system. 3,825,335, Cl. 355-1.000.

Reynolds, Robert, to Polaroid Corporation. Variable color photographic lighting source. 3,825,336, Cl. 355-1.000.

Rheinstahl AG: *See—*
Jeuken, Josef; Vieregge, Gustav; and Meyer, Konrad, 3,824,820.

Rhone-Poulenc S.A.: *See—*
Moyne, Paul, 3,824,703.

Rhudy, Ralph Gene, to General Electric Company. Method for reducing corona in a dynamoelectric machine. 3,824,683, Cl. 29-596.000.

Rice, Eldred A. Spark-ignition internal combustion engine carburetors. 3,825,239, Cl. 261-50.00r.

Rice, Leonard M., to Geschickter Fund for Medical Research. Silicon and germanium substituted azaspiranes. 3,825,546, Cl. 260-293.660.

Richards, Edward F.; and Depperman, Warren B., to Martin-Marietta Corporation. High speed fluidic devices. 3,825,739, Cl. 235-201.0pf.

Richards, Gary E.: *See—*
Scherer, Carl A.; and Richards, Gary E., 3,824,802.
Richardson, Harvey J.: *See—*
Bradford, Robert S.; Richardson, Harvey J.; Dubbe, Richard F.; and Ebbinga, Richard D., 3,825,675.
Richardson, Raymond C. Power feed sander. 3,824,740, Cl. 51-33.00r.
Richardson, Rolland A., to Canron, Inc. Programming system for press brakes or the like. 3,824,822, Cl. 72-36.000.
Richardson, William D., to Tuthill Pump Company. Connecting plug for testing tubes and with internal valve therein. 3,825,223, Cl. 251-149.600.
Ridder, Gerhard: *See—*
Hansgen, Klaus; Ridder, Gerhard; and Schuhmann, Bernd, 3,824,879.
Riggs, Peter Philip, to Amsted Industries Incorporated. Lubricated plastic impregnated wire rope. 3,824,777, Cl. 57-149.000.
Riken Light Metal Industries Co., Ltd.: *See—*
Nagano, Toshihiro; Suzuki, Mastsuo; Sano, Yoshio; Aoshima, Yasuo; and Suzuki, Shozo, 3,824,952.
Riley, Arthur F., to Teletype Corporation. High-speed printer having improved ribbon driving, reversing and tensioning mechanism. 3,825,103, Cl. 197-164.000.
Riley, Frank E. C., 20% to Lee, Raymond, Organization, Inc., The. Multi-changeable lampshade. 3,825,743, Cl. 240-144.000.
Rinkleib, Helfried O.: *See—*
Johnston, Daniel H.; Mannheimer, Rudy; Rinkleib, Helfried O.; Walker, Ivan D.; and Kellner, John R., 3,825,208.
Ripley, Lionel George: *See—*
Kendler, Hayden Brian; Ripley, Lionel George; and Woollons, David John, 3,825,746.
Ritze, Arno, to Compur-Werk Gesellschaft mit beschrankter Haftung & Co. Telephone answering apparatus with system failure detection means. 3,825,688, Cl. 179-6.00r.
Rixon Electronics, Inc.: *See—*
Stuart, Richard; and Bhopale, Arvind M., 3,825,834.
Rizzo, Frank J., Jr.: *See—*
Ewing, Bruce A.; and Rizzo, Frank J., Jr., 3,825,420.
Rizzo, Joseph Edward, to United Kingdom of Great Britain and Northern Ireland, Secretary of State for Defense in Her Britannic Majesty's Government of the. Interferometers for fluid flow measurements. 3,825,346, Cl. 356-106.000.
Ro. Jai G.: *See—*
Willert, William H.; and Ro. Jai G., 3,824,875.
Roberts, Donald H. Hobble. 3,824,764, Cl. 54-71.000.
Roberts, Edward David: *See—*
Martin, Barry Forester; and Roberts, Edward David, 3,825,466.
Roberts, Leonard N., to Talley-Trac Corporation, mesne. Liquid explosive for well fracturing. 3,825,452, Cl. 149-38.000.
Roberts, Rene Marie-Joseph: *See—*
Koleske, Joseph Victor; Roberts, Rene Marie-Joseph; and DelGiudice, Frank Paul, 3,825,620.
Roberts, Stuart J.; Rosenbaum, Harold; and Inspector, Sol, to Rosenbaum, Harold and said Roberts, Stuart J. assor. to said Inspector, Sol. Animated operator for electrical switches. 3,825,710, Cl. 200-231.000.
Robertshaw Controls Company: *See—*
Demi, Roy C., 3,825,225.
Dykzeul, Theodore J., 3,825,399.
Genbauffe, Francis S., 3,825,029.
Hardin, George T., 3,824,860.
Jess, Thurman S.; and Jackson, Wilbur F., 3,825,868.
Katchka, Jay R.; Hendrick, Fred W.; and Egger, Michael E., 3,825,398.
Robeson, Lloyd M.; Pilato, Louis A.; and Godlewski, Robert E., to Union Carbide Corporation. Impact modified blends of vinyl chloride polymers, lactone graft copolymers and styrene-diene-styrene block copolymers. 3,825,622, Cl. 260-876.00b.
Robin, Maurice Henry, to Imperial Chemical Industries Limited. Injection molding of foam cored sandwich structures. 3,825,637, Cl. 264-55.000.
Robinson, Charles C.: *See—*
Shaw, Robert; and Robinson, Charles C., 3,825,500.
Robinson, Clayton F., to Honeywell Inc. Chart transport. 3,825,202, Cl. 242-67.200.
Robinson, Frank: *See—*
Betts, Max William; and Robinson, Frank, 3,824,810.
Robinson, Kenneth Buckley, to Thorn Electrical Industries Limited. Lamp cap construction. 3,825,785, Cl. 313-43.000.
Robitaille, Kenneth L.: *See—*
Gatland, Geoffrey H.; and Robitaille, Kenneth L., 3,825,809.
Roblin,Gerard: *See—*
Nomarski, Georges; and Roblin,Gerard, 3,825,348.
Roder, Wolfgang; Volkner, Wolfgang; and Rusch, Dieter, to Licentia Patent-Verwaltungs-G.m.b.H. Fastening of erosion protective strips to aircraft profiles. 3,825,371, Cl. 416-224.000.
Rodvien, Samuel H. Folding display. 3,825,216, Cl. 248-174.000.
Roemer, Bruce W., to Barker Manufacturing Company. Internally reinforced drawer guide. 3,825,310, Cl. 308-3.600.
Roeser, John O., to Otto Engineering, Inc. Temperature and humidity test apparatus. 3,825,723, Cl. 219-401.000.
Rokosz, Ferdinand; and Sausville, Joseph W., to Westinghouse Electric Corporation. Discharge lamp and coating. 3,825,792, Cl. 313-487.000.
Rolair Systems, Inc.: *See—*
Burdick, Robert E.; and Wolf, Baxter K., 3,825,093.
Burdick, Robert E., 3,825,094.
Roland Offsetmaschinenfabrik Faber & Schleicher AG: *See—*
Langer, Karl, 3,824,928.
Roll, William D., to University of Toledo, The. N-cyclopentyl-N-2-hydroxyalkyl-ring-substituted benzamides. 3,825,595, Cl. 260-558.00r.
Rollei-Werke Franke & Heidecke: *See—*
Sobotta, Reinhard, 3,825,334.
Rolls-Royce (1971) Limited: *See—*
McMurtry, David Roberts; and Agg, Michael John, 3,825,370.
Romanenko, Anatoly Mikhailovich: *See—*
Sinichenko, Anatoly Afanasievich; Romanenko, Anatoly Mikhailovich; Sukhov, Evgeny Alexeevich; and Markovsky, Grigory Fedorovich, 3,824,760.
Romay AG: *See—*
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Romberg, Felix B. Traction gate. 3,825,053, Cl. 160-328.000.
Roodvoets, Roger J.; and Nielsen, Edward G., to Laser Alignment, Inc. Apparatus for installing ceilings. 3,824,666, Cl. 29-200.00p.
Rorer, William H., Inc.: *See—*
Diamond, Julius; and Santora, Norman J., 3,825,553.
Diamond, Julius; and Santora, Norman J., 3,825,587.
Rorer, William H., Jr.: *See—*
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Rosenbaum, Harold: *See—*
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Rosenberry, George Mowry, Jr.: *See—*
Baumann, Frederick William; Kaczkowski, Bernard Ceasar; Rosenberry, George Mowry, Jr.; and Smith, William R., 3,825,057.
Rosenblatt, Jerome J.: *See—*
Altman, Richard M.; and Rosenblatt, Jerome J., 3,825,315.
Rosier, Laurence L.: *See—*
Hendel, Robert J.; Jamba, Theodore F., Jr.; Keefe, George E.; and Rosier, Laurence L., 3,825,885.
Rost, Kai Lennart. Waste water treatment unit. 3,825,119, Cl. 210-97.000.
Rostler, Fritz S., to Phillips Retroleum Company. Emulsion bases and emulsions. 3,825,513, Cl. 260-28.5as.
Roszinski, Hilmar: *See—*
Mietens, Gerhard; Kohler, Gerd; Haas, Hans; and Roszinski, Hilmar, 3,825,628.
Rototron Corporation: *See—*
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Roudabush, Douglas E.: *See—*
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Roussel Uclaf: *See—*
Hagemann, Guy; and Clemence, Francois, 3,825,664.
Rouverol, William S. Rolling contact gearing. 3,824,873, Cl. 74-462.000.
Rovner, Leopold. Apparatus for detecting the direction of a magnetic field relative to a marker direction by sequentially scanning plural stationary sensors. 3,825,823, Cl. 324-43.00r.
Rowell, Frank John. Apparatus for producing packaging articles. 3,824,908, Cl. 93-8.0vl.
Roworth, Donald Anthony Acott, to International Standard Electric Corporation. Helium environment vocoder. 3,825,685, Cl. 179-1.0sa.
Rubbermaid Sales Corp.: *See—*
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Rubin, Jerome and Davis, Michael H., mesne: *See—*
Rubin, Jerome; and Lockner, Avery, 3,825,947.
Rubinoff, Mark. Expanded chess and checker board. 3,825,267, Cl. 273-131.00b.
Rudszinat, Willy: *See—*
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Ruff, Herbert L. Dental brace band for upper incisor teeth. 3,824,690, Cl. 32-14.00a.
Ruffinatti, Giovanni, to Ruffinatti, Giovanni, & Co., S.A.S. Machine for drawing sugar based plastic material. 3,825,234, Cl. 259-186.000.
Ruffinatti, Giovanni, & Co., S.A.S.: *See—*
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Ruider, Guenther; and Dimroth, Peter. AZO dye of A 3-aminophthalimide and containing carbamoyl moieties. 3,825,527, Cl. 260-152.000.
Runkle, Donald L.; and Hughes, Charles N., to General Motors Corporation. Rotary engine and transmission assembly mounting system. 3,825,090, Cl. 180-64.00r.
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Rupp, Wiktor J., to Itek Corporation. Toric surface generating method and apparatus. 3,824,742, Cl. 51-54.000.
Ruralist Press, Inc.: *See—*
Pugh, K. O.; Ivey, Howard; and Cobb, Austell C. A., 3,824,927.
Rusch, Dieter: *See—*
Roder, Wolfgang; Volkner, Wolfgang; and Rusch, Dieter, 3,825,371.
Ruskin, Wallace R., to Infra-Data, Inc. Gauge for polymers. 3,825,755, Cl. 259-339.000.
Russell, Burdsall & Ward, Inc.: *See—*

Beller, Herbert R.; and Onufer, George R. (said Onufer assor. to), 3,824,791.

Russell, Stanley L.: *See—*
Gueldenpfennig, Klaus; Pommerening, Uwe A.; and Russell, Stanley L., 3,825,692.

Rutty, Edward Charles, to Stanley Works, The. Level with novel vial mounting arrangement. 3,824,700, Cl. 33-379.000.

Ryan, Edward J.: *See—*
Ryan, Richard Burns, 3,824,964.

Ryan, Patricia K.: *See—*
Ryan, Richard Burns, 3,824,964.

Ryan, Richard Burns, to Ryan, Edward J. and Ryan, Patricia K. Automated pleater for draperies. 3,824,964, Cl. 223-30.000.

Sadler, Keith A.; and Phillips, Ralph E., Jr. Clock controlled thermosat. 3,825,872, Cl. 337-301.000.

Saiki, Noritsugu: *See—*
Ashida, Takao; Kurihara, Osamu; Nawata, Kiyoshi; Shinoki, Takanori; Fujita, Yutaka; Yamashita, Gentaro; and Saiki, Noritsugu, 3,825,508.

Saito, Nagao; Kobayashi, Kazuhiko; and Takagi, Shigeru, to Mitsubishi Denki Kabushiki Kaisha. Process for controlling electrical discharge shaping. 3,825,715, Cl. 217-69.00m.

Saito, Shigeru, to Nissan Motor Company, Limited. Apparatus for producing an assembly of a metal tubing and serrated rod. 3,824,665, Cl. 29-200.00b.

Saito, Tadaomi; Takehara, Masahiro; Yamada, Kazuhiko; Yoshida, Ryonosuke; and Sasaki, Yukiko. N-monacylderivatives of arginine. 3,825,560, Cl. 260-326.450.

Sakuma, Hiraku: *See—*
Inoue, Eiichi; Tsujiuchi, Junpei; Kokado, Hiroshi; Yamaguchi, Takashi; Shimizu, Isamu; Sakuma, Hiraku; Hanada, Hiroshi; and Tokunaga, Yukio, 3,825,317.

Salerno, Paul G.; Sikorcin, John; and Piecuch, Richard Wm., to Vapor Corporation. Inline valve. 3,825,026, Cl. 137-219.000.

Sampson Corporation, The: *See—*
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Samuel, Duncan Roy; and Moore, Donald Fergus, to Radun Controls Limited. Transducer devices and apparatus including such devices. 3,825,025, Cl. 137-92.000.

Sanchex, Gil C. Water distiller and cooler unit. 3,825,491, Cl. 202-176.000.

Sander, Bruno: *See—*
Schecker, Hans-Georg; Koehler, Waldemar; and Sander, Bruno, 3,825,568.

Sanders Associates, Inc.: *See—*
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Hayner, Paul F., 3,825,033.
Ramsden, Paul S., Jr., 3,825,676.
Saunders, Roger I.; and Cloutier, Edward J., 3,825,213.

Sandmark, Carl Ake. Refrigerating machines. 3,824,804, Cl. 62-238.000.

Sandoz Ltd.: *See—*
Hofer, Kurt; and Tscheulin, Guenther, 3,825,629.
Schoenauer, Wolfgang; and Wald, Roland, 3,825,564.
Seemann, Fritz, 3,825,558.

Sandoz-Wander, Inc.: *See—*
Houlihan, William J., 3,825,594.
King, William R., 3,824,999.

Sandschaper, Delmer J. Fish line light. 3,824,731, Cl. 43-17.500.

Sanjean, John; and Cahoy, Roger P., to Gulf Research & Development Company. Method of combating insect pests with phenylcarbamyl oxyditert. butylbensylidenemalononitriles. 3,825,663, Cl. 424-300.000.

Sankin Engineering Company Limited: *See—*
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Sano, Yoshio: *See—*
Nagano, Toshihiro; Suzuki, Mastsuo; Sano, Yoshio; Aoshima, Yasuo; and Suzuki, Shozo, 3,824,952.

Sansui Electric Co., Ltd.: *See—*
Ito, Ryosuke; and Takahashi, Susumu, 3,825,684.

Santa Barbara Research Center: *See—*
Cinzori, Robert J.; and Stapleton, Gerald F., 3,825,754.

Santangelo, Joseph. Rod and resiliently projected ring. 3,825,263, Cl. 273-100.000.

Santer, James O.: *See—*
Markhart, Albert H.; and Santer, James O., 3,825,511.

Santora, Norman J.: *See—*
Diamond, Julius; and Santora, Norman J., 3,825,553.
Diamond, Julius; and Santora, Norman J., 3,825,587.

Santos, Anthony R.; Santos, Ontario R.; and Allen, Gerald Dean. Device for removing noxious matter from exhaust gases. 3,824,769, Cl. 55-223.000.

Santos, Ontario R.: *See—*
Santos, Anthony R.; Santos, Ontario R.; and Allen, Gerald Dean, 3,824,769.

Sarbacher, Robert I: *See—*
Bogue, John C.; and Sarbacher, Robert I, 3,825,833.

Sarcia, Domenico S., to Amron Research and Development Corporation. Embossed card reader and imprinter. 3,825,727, Cl. 235-61.11r.

Sarkes Tarzian, Inc.: *See—*
Shields, Marvin L., 3,825,767.

Sarnacki, Frank H.; and Steenstrup, Robert V., to International Business Machines Corporation. Apparatus for soldering printed circuit cards. 3,825,164, Cl. 228-37.000.

Sartorio, Franco, to D.E.A. Digital Electronic Automation S.p.A. Tridimensional universal tracer, slidable on a air bearings for continuous, high-speed copying of profiles of models. 3,824,893, Cl. 90-62.00a.

Sartorius-Membranfilter GmbH: *See—*
Lorenz, Gerhardt, 3,825,345.

Sartory, Walter K., to United States of America, Atomic Energy Commission. Centrifugal particle elutriator and method of use. 3,825,175, Cl. 233-2.000.

Sasaki, Juntaro: *See—*
Wata, Tadao; Yusawa, Motoyasu; and Sasaki, Juntaro, 3,825,523.

Sasaki, Yukiko: *See—*
Saito, Tadaomi; Takehara, Masahiro; Yamada, Kazuhiko; Yoshida, Ryonosuke; and Sasaki, Yukiko, 3,825,560.

Sato, Takeshi: *See—*
Nakamura, Kihei; Yamazaki, Harumichi; Masuda, Hirotsugu; Sato, Takeshi; and Kiuchi, Yoshinori, 3,825,292.

Sattler, Walter J., to General Motors Corporation. Ignition spark vacuum advance system. 3,824,972, Cl. 123-117.00a.

Sauget, Andre: *See—*
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Saunders, James W.; and Stephens, Donald L., to Paccar Inc. Truck cab latch. 3,825,295, Cl. 296-35.00r.

Saunders, Roger I.; and Cloutier, Edward J., to Sanders Associates, Inc. Release mechanism for a sonobuoy rotochute assembly. 3,825,213, Cl. 244-138.00a.

Sausville, Joseph W.: *See—*
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Savin Business Machines Corporation: *See—*
Smith, Ian E.; and Scroggs, Dennis I., 3,825,191.

Savitsky, Vladilen Nikolaevich: *See—*
Smirnov, Mikhail Dmitrievich; Ershov, Boris Alexandrovich; Savitsky, Vladilen Nikolaevich; Breev, Boris DmitrievICH; Atkarsky, Anatoly Alexandrovich; Shardakov, Svyatoslav Viktorovich; Sinajuk, David Aronovich; Stukalov, Vladimir Nikolaevich; and Puzynya, eonid Vasilievich, 3,824,642.

Savolainen, Jouko E.: *See—*
Gresky, Alan T.; Savolainen, Jouko E.; McDuffee, William T., Jr.; and Wischow, Russell P., 3,825,649.

Sawicki, Raymond P.: *See—*
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Schachte, John J.: *See—*
Osburn, John G.; and Schachte, John J., 3,825,245.

Schacket, Robert, to Electrospace Corporation. Lamp failure detector assembly. 3,825,914, Cl. 340-251.000.

Schatz, Paul. Apparatus for generating a wobble motion. 3,824,866, Cl. 74-61.000.

Schecker, Hans-Georg; Koehler, Waldemar; and Sander, Bruno. Production of anhydrous 1,4-dioxane. 3,825,568, Cl. 260-340.600.

Scherber, Werner, to Licentia Patent-Verwaltungs-G.m.b.H. Method of manufacturing a field effect transistor. 3,824,677, Cl. 29-571.000.

Scherer, Carl A.; and Richards, Gary E., to General Motors Corporation. Control means for accumulator throttling device. 3,824,802, Cl. 62-217.000.

Scherf, Thomas W., to Aluminum Company of America. Eave structure. 3,824,749, Cl. 52-11.000.

Schiesterl, Gerhard; and Wulf, Helmut, to Daimler-Benz Aktiengesellschaft. Passenger protective installation for vehicles, especially for motor vehicles. 3,825,278, Cl. 280-150.0ab.

Schindler, Hans R.: *See—*
Frei, Armin H.; Schindler, Hans R.; and Vettiger, Peter, 3,825,832.

Schippers, Heinz; Lenk, Erich; and Busch, Hansjochen, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Winding device with drive-roller drive. 3,825,206, Cl. 242-18.0dd.

Schlage Lock Company: *See—*
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Schleicher, Lothar: *See—*
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Schliebs, Reinhard: *See—*
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Schlumberger Technology Corporation: *See—*
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Schmaltz, Edwin. Concrete form work joint members. 3,825,220, Cl. 249-194.000.

Schmalz, Paul: *See—*
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Schmeichel, Edmund D.: *See—*
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Schmeichel, Edmund E., to Schmeichel, Edmund D. Trailer jack support means for mobile homes. 3,825,279, Cl. 280-150.500.

Schmidt, Felix Helmut: *See—*
Weber, Helmut; Aumuller, Walter; Weyer, Rudi; Muth, Karl; and Schmidt, Felix Helmut, 3,825,665.

Schmidt, Jochen: *See—*
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Schmidt, Robert: *See—*
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Schneider, Franz: *See—*
Bergmann, Ewald; Schneider, Franz; Brandstetter, Rudi; and Kellenbenz, Rolf, 3,824,821.

Schneider, Johannes; and Pungs, Wolfgang, to Dynamic Nobel AG. Glass fiber-reinforced, terephthalic acid-containing polyamide molding compounds. 3,825,516, Cl. 260-37.00n.

Schneider, Rolf; and Muller, Hans-Martin, to Bosch, Robert, G.m.b.H. Air-fuel supply mixture control system for internal combustion engines. 3,824,966, Cl. 123-32.0ae.

Schneider-Arnoldi, Alfred; Gabler, Helmut; and Kandler, Joachim, to Knapsack Aktiengesellschaft. Hydraulic binder. 3,825,433, Cl. 106-89.000.

Schnettler, Richard A.: *See—*
Suh, John T.; and Schnettler, Richard A., 3,825,590.

Schober, Helmut; and Marquardt, Bernd, to Sick, Erwin, Optik-Elektronid, Firma. Photoelectric surface scanning device. 3,825,765, Cl. 250-563.000.

Schoeff, John A., to Motorola, Inc. Method for fabricating polycrystalline structures for integrated circuits. 3,825,450, Cl. 148-175.000.

Schoeff, John A., to Motorola, Inc. Method for fabricating polycrystalline structures for integrated circuits. 3,825,451, Cl. 148-175.000.

Schoenauer, Wolfgang; and Wald, Roland, to Sandoz Ltd. Anthraquinone sulfonic acids. 3,825,564, Cl. 260-372.000.

Schon, Nutrizio Maria; and Abate, Loris. Neck-tie or the like and method of manufacture thereof. 3,824,627, Cl. 2-146.000.

Schoonover, Stanley C.: *See—*
Price, Ralph E.; and Schoonover, Stanley C., 3,824,743.

Schrecongost, Ray B., to Hammond Corporation. Alternate high-low and root-fifth selection system for electrical musical instruments. 3,825,667, Cl. 84-1.010.

Schroder, Rolf: *See—*
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Schubert, James R.: *See—*
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Schubert, Wilfried, to National Advertising Company. Changeable multiple image display apparatus. 3,824,726, Cl. 40-132.00r.

Schuhmann, Bernd: *See—*
Hansgen, Klaus; Ridder, Gerhard; and Schuhmann, Bernd, 3,824,879.

Schulein, Joseph, and Schulein, Margarite A.: *See—*
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Schuler, L., GmbH: *See—*
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Schumaker, Aaron C.; and Hay, Isaac K., Jr., to Crested Butte Records, Inc. Record cover. 3,825,112, Cl. 206-310.000.

Schwank GmbH: *See—*
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Schwartz, Harold E., Jr.: *See—*
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Schwartz, James W., to Zenith Radio Corporation. Method of forming sheet glass color tube face panel with pleated skirt. 3,825,413, Cl. 65-61.000.

Schwarz, Bernhard. Head and neck rest. 3,825,301, Cl. 297-408.000.

Schwarz, Josef, to Lingl Corporation. Brick gripping apparatus. 3,825,293, Cl. 294-63.00r.

Schwarzkopf, Daniel: *See—*
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Schwertfeger, Walter; and Stillhard, Bruno. Method and apparatus for processing plasticizable material. 3,825,235, Cl. 259-191.000.

Sciabica, Francis A., to General Motors Corporation. Acceleration enrichment. 3,824,983, Cl. 123-32.0ea.

Scopa, Paul P.; and Kelman, Naomi S. Educational device. 3,824,706, Cl. 35-9.00c.

Scott, O.M., & Sons Company, The: *See—*
Wittenbrook, Lawrence S.; and Timmons, Richard J., 3,825,551.

Scrima, Joseph E. Foot conforming insole for a shoe. 3,825,017, Cl. 128-622.000.

Scroggs, Dennis I.: *See—*
Smith, Ian E.; and Scroggs, Dennis I., 3,825,191.

Sea-Land Service, Inc.: *See—*
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Searle Medidata, Inc.: *See—*
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Sears, Roebuck and Co.: *See—*
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Secondary Processing Systems, Inc.: *See—*
Brumagim, Ivan S., 3,824,968.

Seeff, Morris. Cladding sheets. 3,824,664, Cl. 29-180.0ss.

Seemann, Fritz, to Sandoz Ltd. Substituted aminopropoxy-2-indolinones. 3,825,558, Cl. 260-325.000.

Seidler, David, to Applicator Brush Company, Inc. Cosmetic applicator. 3,825,021, Cl. 132-88.700.

Seki, Takeo; Kawamura, Shigenori; Maeda, Itsuji; and Kaneko, Akira, to Hatachi Electronics Co., Ltd. and Nisshin Steel Co. Ltd. Automatic surface inspection device for running object. 3,825,351, Cl. 356-200.000.

Sekido, Fujihiko: *See—*
Ohtsu, Takawo; Nakamura, Yukinobu; and Sekido, Fujihiko, 3,824,838.

Sekine, Chiu: *See—*
Ono, Yoshio; Sekine, Chiu; Takaoka, Naotoshi; and Asai, Nobuyoshi, 3,825,870.

Sell, Victor L.; and Alvi, Syed M. S., to Ampex Corporation. Planar core memory stack. 3,825,907, Cl. 340-174.0ma.

Sello, Stephen B.; and Gaj, Bernard J., to Stevens, J. P., & Co., Inc. Phosphonate carbomates. 3,825,630, Cl. 260-938.000.

Semperit Aktiengesellschaft: *See—*
Hartl, Gerhard, 3,825,184.
Kaltenbock, Karl, 3,824,960.

Sesto, Peter Joseph, to G & S Mold & Die, Inc.; d/b/a AAA Tool & Die. Self-contained die protecting device. 3,825,385, Cl. 425-137.000.

Sgombick, John: *See—*
Lawlor, John; and Sgombick, John, 3,824,708.
Lawlor, John; and Sgombick, John, 3,824,711.

Shafer, Jon L., to Shafer Valve Company. Spring return for piston operator. 3,824,901, Cl. 92-13.600.

Shafer Valve Company: *See—*
Shafer, Jon L., 3,824,901.

Shaffer, Robert A.: *See—*
Korner, Renzo L.; White, Ralph J.; Shaffer, Robert A.; and Turner, George R., 3,825,669.

Shandel, Frederick. Camping tool. 3,824,641, Cl. 7-14.550.

Shanks, Howard R.: *See—*
Wechter, Margaret A.; and Shanks, Howard R., 3,825,482.

Shapland, James T., to United States Steel Corporation. Apparatus for introducing gas to hot metal in a bottom pour vessel. 3,825,241, Cl. 266-38.000.

Shardakov, Svyatoslav Viktorovich: *See—*
Smirnov, Mikhail Dmitrievich; Ershov, Boris Alexandrovich; Savitsky, Vladilen Nikolaevich; Breev, Boris DmitrievICH; Atkarsky, Anatoly Alexandrovich; Shardakov, Svyatoslav Viktorovich; Sinajuk, David Aronovich; Stukalov, Vladimir Nikolaevich; and Puzynya, eonid Vasilievich, 3,824,642.

Shaw, Robert; and Robinson, Charles C., to American Optical Corporation. Neodymium glass laser having room temperature output at wavelengths shorter than 1060 nm. 3,825,500, Cl. 252-301.40f.

Shelander, Charles, to Preload Technology, Inc. Precast concrete wall structure for waste treatment tanks. 3,824,751, Cl. 52-173.000.

Shell Oil Company: *See—*
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Lutz, Eugene F., 3,825,615.

Shenondoah Plastics Corporation: *See—*
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Shephard, Kevin: *See—*
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Sheppard Equipment Limited: *See—*
Mackrill, David; Carpenter, Denis Cecil John; and Howard, Michael John, 3,825,137.

Sherwood, Henry A.: *See—*
Hughes, David C.; and Sherwood, Henry A., 3,825,847.

Sheth, Krishnakant K.: *See—*
Reiter, William M.; Cooper, James E.; and Sheth, Krishnakant K., 3,825,512.

Shields, Marvin L., to Sarkes Tarzian, Inc. Rectifier assembly. 3,825,767, Cl. 307-100.000.

Shiley, Donald P. Pivoted discoid heart valve having a changing pivot axis. 3,824,629, Cl. 3-1.000.

Shimizu, Hidenori: *See—*
Tajika, Kazuya; and Shimizu, Hidenori, 3,824,979.

Shimizu, Hitoshi: *See—*
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Shimizu, Isamu: *See—*
Inoue, Eiichi; Tsujiuchi, Junpei; Kokado, Hiroshi; Yamaguchi, Takashi; Shimizu, Isamu; Sakuma, Hiraku; Hanada, Hiroshi; and Tokunaga, Yukio, 3,825,317.
Inoue, Eiichi; Shimizu, Isamu; Kobayashi, Hajime; and Endo, Ichiro, 3,825,427.

Shimojima, Yukiji: *See—*
Takeda, Isao; Mizuno, Masayuki; Sugawara, Toshiaki; Shimojima, Yukiji; and Horiguchi, Sadayuki, 3,825,660.

Shingler, Thomas M., to Cyclops Corporation, mesne. Hanging scaffolding. 3,825,098, Cl. 182-106.000.

Shinoki, Takanori: *See—*
Ashida, Takao; Kurihara, Osamu; Nawata, Kiyoshi; Shinoki, Takanori; Fujita, Yutaka; Yamashita, Gentaro; and Saiki, Noritsugu, 3,825,508.

Shiokawa, Kozo: *See—*
Kishino, Shigeo; Kudamatsu, Akio; Takase, Iwao; Shiokawa, Kozo; and Yamaguchi, Shini-Ichi, 3,825,636.

Shipkowski, Eugene R.: *See—*
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Shirai, Kiyoshi: *See—*
Katsumata, Mitsuo; Miyamoto, Mitsunori; and Shirai, Kiyoshi, 3,824,976.

Shiroyama, Kaisuke; and Yokoyama, Takeo, to Furukawa Company Limited, The. Submarine cable-burying devices. 3,824,798, Cl. 61-72.400.

Sholler, Robert L. Wire grip. 3,824,653, Cl. 24-134.0kb.

Shook, Russel W. Apparatus for controlling flow of blood. 3,825,008, Cl. 128-327.000.

Short, Lot W. Drilling bit for earth formations. 3,825,080, Cl. 175-65.000.

Short, Melvin G.: *See—*
Grosko, John A.; Short, Melvin G.; and Stull, James T., 3,825,056.

Showa Denko Kabushiki Kaisha: *See—*
Naito, Taketosi; and Ito, Masatomo, 3,825,596.

Sibley, Henry C.; Auer, John H., Jr.; and Smith, Willis R., to General Signal Corporation. Overspeed detector for vehicle control system. 3,825,744, Cl. 246-182.00c.

Sick, Erwin, Optik-Elektronid, Firma: *See—*
Schober, Helmut; and Marquardt, Bernd, 3,825,765.

Siemag Siegener Maschinenbau G.m.b.H.: *See—*
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Siemens Aktiengesellschaft: *See—*
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Fruth, Hans; and Muller, Wolfgang, 3,825,084.
Mosch, Willi; Lutz, Gerhard; and Martin, Heinz, 3,824,679.
Olsson, Sven-Gunnar Sigvard, 3,824,902.
Soldner, Richard; and Naefe, Gerhard, 3,824,988.

Sierracin Corporation, The: *See—*
Laidlaw, H. Gordon, Jr.; and Levin, Berton P., 3,825,918.
Levin, Berton P.; and Nelson, Roger E., 3,825,919.
Lucky, Clyde L., 3,825,917.
Nelson, Roger E.; and Lucky, Clyde L., 3,825,920.

Sigmund, Jerry A., to Standard Pressed Steel Co. Self-locking bolt. 3,825,051, Cl. 151-37.000.

Sikorcin, John: *See—*
Salerno, Paul G.; Sikorcin, John; and Piecuch, Richard Wm., 3,825,026.

Simons, Charles W.: *See—*
O'Neill, Gerald J.; Simons, Charles W.; and Billings, Charles A., 3,825,606.

Sinajuk, David Aronovich: *See—*
Smirnov, Mikhail Dmitrievich; Ershov, Boris Alexandrovich; Savitsky, Vladilen Nikolaevich; Breev, Boris DmitrievICH; Atkarsky, Anatoly Alexandrovich; Shardakov, Svyatoslav Viktorovich; Sinajuk, David Aronovich; Stukalov, Vladimir Nikolaevich; and Puzynya, eonid Vasilievich, 3,824,642.

Sinar AG Schaffhausen: *See—*
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Sine, Dale E.: *See—*
Maruscak, John; and Sine, Dale E., 3,824,722.

Singer Company, The: *See—*
Cederberg, Howard R.; and Wiedeman, Charles W., 3,825,681.
Evnas, John L.; De Cotiis, C. John; and Johnson, Victor P., 3,824,865.

Sinichenko, Anatoly Afanasievich; Romanenko, Anatoly Mikhailovich; Sukhov, Evgeny Alexeevich; and Markovsky, Grigory Fedorovich. Method and installation for fabricating, filling and sealing sacks made from thermoplastic material. 3,824,760, Cl. 53-29.000.

Sintokogio, Ltd.: *See—*
Miura, Takashi; Sugiura, Takashi; and Iyoda, Yoshizi, 3,825,058.

Sire, Gerard, to Thomson-CSF. Amplifier tube for power amplification. 3,825,853, Cl. 330-53.000.

Skatsche, Othmar; Thien, Gerhard; and Kirchweger, Karl, to List, Hans. Internal combustion engine with two intake and two exhaust valves. 3,824,971, Cl. 123-75.00b.

Skinner, Robert Thomas John, to Lucas Aerospace Limited. Fuel control apparatus for gas turbine engine. 3,824,786, Cl. 60-243.000.

Smirnov, Mikhail Dmitrievich; Ershov, Boris Alexandrovich; Savitsky, Vladilen Nikolaevich; Breev, Boris DmitrievICH; Atkarsky, Anatoly Alexandrovich; Shardakov, Svyatoslav Viktorovich; Sinajuk, David Aronovich; Stukalov, Vladimir Nikolaevich; and Puzynya, eonid Vasilievich. Machine for pulling over and cement lasting of the forepart of a shoe upper. 3,824,642, Cl. 12-10.500.

Smith, Eastman. Instrument for improved eyesight-refraction testing. 3,825,326, Cl. 351-32.000.

Smith, Floyd Reid. Stook invertor. 3,825,140, Cl. 214-768.000.

Smith, Forest D., to Electric Machinery Mfg. Company. Temperature measuring system for rotating machines. 3,824,857, Cl. 73-351.000.

Smith, Herman W.; and Berka, Paul H., to Aluminum Company of America. System and method for monitoring a press load. 3,825,811, Cl. 318-646.000.

Smith, Horace L., Jr., to Smitherm Industries, Inc. Valves for roasting apparatus and other applications. 3,825,221, Cl. 251-62.000.

Smith, Ian E.; and Scroggs, Dennis I., to Savin Business Machines Corporation. Centrifugal mill for contact transfer electrostatic copier. 3,825,191, Cl. 241-46.110.

Smith, John F., to Narco Scientific Industries, Inc. Audio threshold leveler with noise level suppressor. 3,825,851, Cl. 330-29.000.

Smith, Joseph W.; and Hollencamp, Eugene A., to Carrier Corporation. Hydraulic valve seat expander. 3,824,667, Cl. 29-200.00b.

Smith, Richard L.: *See—*
Finn, Lawrence R.; and Smith, Richard L., 3,824,759.

Smith, Rodney E.: *See—*
Green, B. Sherman; Green, Charles K.; Glancy, Jack L.; Myrick, Floyd J.; Norlander, Carl William; and Smith, Rodney E., 3,824,916.

Smith, Wayne A.: *See—*
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Bennet, Stanford M.; Smith, William; and Thomas, Joseph J., 3,825,001.

Smith, William R.: *See—*
Baumann, Frederick William; Kaczkowski, Bernard Ceasar; Rosenberry, George Mowry, Jr.; and Smith, William R., 3,825,057.

Smith, William Ralph; and Deutsch, Herman, to Tele/Resources, Inc. Time division multiplex branch exchange. 3,825,693, Cl. 179-15.0at.

Smith, Willis R.: *See—*
Sibley, Henry C.; Auer, John H., Jr.; and Smith, Willis R., 3,825,744.

Smitherm Industries, Inc.: *See—*
Smith, Horace L., Jr., 3,825,221.

Smithkline Corporation: *See—*
Loev, Bernard, 3,825,547.

Smolka, Carl M. Automatic antenna coupler utilizing system for measuring the real part of the complex impedance or admittance presented by an antenna or other network. 3,825,825, Cl. 324-57.00r.

Snyder, Bobbie L.: *See—*
Lieberman, Edgar M.; and Snyder, Bobbie L., 3,825,300.

Snyder, George W., to Celanese Corporation. First aid dressing for wounds or burns. 3,824,998, Cl. 128-157.000.

Sobon, Leon E.: *See—*
Buchanan, Robert A.; Alves, Ronald V.; Maple, T. Grant; and Sobon, Leon E., 3,825,436.

Sobotta, Reinhard, to Rollei-Werke Franke & Heidecke. Feeding mechanism for slide magazines of picture projectors. 3,825,334, Cl. 353-103.000.

Societa' Italiana Resine S.I.R. S.p.A.: *See—*
Vargiu, Silvio; Giovanni, Sesto S.; and Pitzalis, Mario, 3,825,522.

Societe Anonyme Automobiles Citroen: *See—*
Grosseau, Albert, 3,824,878.

Societe Anonyme D.B.A.: *See—*
Papiau, Guy, 3,825,706.

Societe Anonyme de Recherches de Mecanique Appliquee: *See—*
Adelmann, Robert Witsenhausen, 3,825,276.

Societe Anonyme des Usines de Callenelle en abrege Saluc: *See—*
Delmotte, Roger Edmond, 3,825,646.

Societe Anonyme dite; Aquitaine Total Organico: *See—*
Kern, Rene; Poulain, Claude; and Tock, Francois, 3,825,532.

Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Moret, Bernard; and Dufetele, Jean-Louis, 3,824,739.

Societe Anonyme: "Application des Gaz.": *See—*
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Societe Anonyme: Glaenzer Spicer: *See—*
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Societe Anonyme: Poclain le Plessis-Belleville (Oise): *See—*
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Societe des Procedes Modernes d'Injection Sopromi: *See—*
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Societe Honeywell Bull (Societe Anonyme): *See—*
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Societe Industrielle du Metal Usine: *See—*
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Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
Seligny, Marcel Robert; and Bouiller, Jean Georges, 3,824,785.

Soderberg, Raymond Henry, Sr., to R. S. Reciprocating Trainer Enterprises, Inc. Reciprocating walker. 3,824,994, Cl. 128-25.00r.

Soffer, Bernard H.: *See—*
Evtuhov, Viktor; Soffer, Bernard H.; and Tseng, David Y., 3,824,717.

Sohgoh Jidosha Anzen-Kogai Gijutsu Kenkyu Kumiai: *See—*
Matsumura, Yoshihiro, 3,825,799.

Sohn, Jesse S.; and Gunther, Louis A., to Curtiss-Wright Corporation. Method of welding a tube to a tube sheet. 3,824,663, Cl. 29-157.400.

Soldner, Richard; and Naefe, Gerhard, to Siemens Aktiengesellschaft. Ultrasound doppler applicator. 3,824,988, Cl. 128-2.00v.

Soligny, Marcel Robert; and Bouiller, Jean Georges, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Gas ducted fan engines. 3,824,785, Cl. 60-226.00a.

Somcya, Teruo; Kobayashi, Nobuyuki; and Goto, Toshinori, to Nihon Denshi Kabushiki Kaisha. Constant current field emission electron gun. 3,825,839, Cl. 328-9.000.

Sommer, Richard, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Crankshaft with hardened transition portions and its manufacture. 3,824,659, Cl. 29-149.50r.

Sones, William L.: *See—*
La Flame, Frank E.; and Sones, William L., 3,824,974.

Sonoda, Ryuichi; and Ohmae, Tadayuki, to Sumitomo Chemical Company, Ltd. Selective hydrogenation of naphthalenes. 3,825,610, Cl. 260-667.000.

Sonotone Corporation, mesne: *See—*
Jerry, Albert; and Baum, Jasper, 3,825,700.

Sonoyama, Yuzo: *See—*
Kudo, Teizo; Ikeda, Saizo; Sonoyama, Yuzo; and Kotani, Motoharu, 3,825,625.

Sorenson, Charles E.; Stubblefield, Clyde D.; Debaillie, Arnold A.; Bramley, Robert K.; and Bourassa, Hugh A., to Hahn, Inc. Turf maintenance machine. 3,824,772, Cl. 56-7.000.

Spaller, Albert E., Jr.: *See—*
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Spanel, Abram N.: *See—*
Spanel, Abram N.; and Jacobs, David R. (said Jacobs assor to), 3,824,939.

Spanel, Abram N.; and Jacobs, David R., said Jacobs assor to Spanel, Abram N. Method and means of threading and implanting tufting yarn. 3,824,939, Cl. 112-79.0ff.

Spaulding, Milton K. Circulating hand-hold for swimming pools. 3,824,635, Cl. 44-172.180.

Speed King Manufacturing Company, Inc.: *See—*

Wickam, Irwin Edward; and Perkins, Jerry K., 3,825,106.
Speed-O-Print Business Machines Corporation: *See—*
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Sperry Rand Corporation: *See—*
Gonzalez, Robert E.; and Strenglein, Harry G., 3,825,931.
Matthews, Hugh B., 3,824,793.
Speyer, Henning J., to Sears, Roebuck and Co. Barbell with removable weights. 3,825,253, Cl. 272-84.000.
Spreckelmeyer, Bernhard: *See—*
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Sprenger, Gerhard E.: *See—*
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Sprunger, Ivan F. Tamper shield for spring bolt lock. 3,825,291, Cl. 292-346.000.
Squibb, E. R., & Sons Inc.: *See—*
Atwal, Manmohan S.; and Shipkowski, Eugene R., 3,825,530.
Cimarusti, Christopher M.; Giarrusso, Frederick F.; and Levine, Seymour D., 3,825,566.
Denzel, Theodor; and Hoehn, Hans, 3,825,535.
Dolfini, Joseph Edward; and Breauer, Hermann, 3,825,529.
Haugwitz, Rudiger D.; and Narayanan, Venkatachala Lakshmi, 3,825,537.
Perrella, Donald J.; and Dolfini, Joseph E., 3,825,536.
Yale, Harry Louis; and Petigara, Ramesh B., 3,825,549.
St. Lawrence Engine Co. Limited, The: *See—*
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Stacey, Eric J.: *See—*
Gyugyi, Laszlo; Stacey, Eric J.; and Strycula, Eugene C., 3,825,815.
Stafford, Donald Claude; Burns, Gerald Edward; and McKenna, Kerry Charles, to Chicago Bridge & Iron Company. Offshore underwater storage tank. 3,824,942, Cl. 114-.50t.
Stal Refrigeration AB: *See—*
Lundberg, Anders; and Axelsson, Rolf, 3,825,372.
Stal-Laval Turbin AB: *See—*
Stolt, Jan; and Gerward, Christer, 3,824,872.
Staley, A. E., Manufacturing Company: *See—*
Drury, Raymond L., Jr.; Hines, James W.; and Nevin, Charles S., 3,825,514.
Standard Oil Company: *See—*
Bemis, Alan G.; Darin, John K.; and Hoff, Melvern C., 3,825,614.
Standard Pressed Steel Co.: *See—*
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Standard Tool & Manufacturing Co.: *See—*
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Standardwerk Eugen Reis, GmbH: *See—*
Puhahn, Werner, 3,825,200.
Standum, Inc.: *See—*
Paramonoff, Elpidifor; Olsen, Frederick C.; and Labeda, Robert C., 3,825,270.
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Stapleton, Gerald F.: *See—*
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State for Defence, The Secretary of: *See—*
Kitson, George Samuel; and Sutton, Julian MacDonald Davison, 3,824,784.
Stauffer Chemical Company: *See—*
Pallos, Ferenc M.; Lee, Hwalin; and Menn, Julius J., 3,825,602.
Pallos, Ferenc M., 3,825,632.
Pepe, Anthony Enrico, 3,825,618.
Stedman, Robert N.; and Purcell, Robert J., to Caterpillar Tractor Company. Interacting bulldozer stabilizer and equalizer bar. 3,825,074, Cl. 172-803.000.
Steele, Richard K.; and Roudabush, Douglas E., to California Crime Technological Research Foundation. Laser fence. 3,825,916, Cl. 340-258.00b.
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Steiner, Hubert, to Steiner, H., Limited. Road planing machines. 3,825,361, Cl. 404-90.000.
Steinmetz, Ib; and Wentzheimer, William Wayne, to Sun Oil Company of Pennsylvania. Extraction process. 3,825,489, Cl. 208-327.000.
Stelzenmuller, William K.: *See—*
Hamel, Harvey C.; Kunzinger, Charles A.; and Stelzenmuller, William K., 3,825,906.
Stent, Vernon Denis, to Creators Limited. Reinforced plastics tubes. 3,825,036, Cl. 138-174.000.
Stephans, Albert E.: *See—*
Bowers, Gary L.; Lay, Clark M.; and Stephans, Albert E., 3,825,735.
Stephens, Donald L.: *See—*
Saunders, James W.; and Stephens, Donald L., 3,825,295.
Sterman, Albert P.: *See—*
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Sternbeck, Olaf, to Telefonaktiebolaget L M Ericsson. Integrated amplifier. 3,825,848, Cl. 330-17.000.
Stevels, Albert Leendert Nicolaas: *See—*
Ligtenberg, Martinus Adrianus Cornelis; Stevels, Albert Leendert Nicolaas; and De Pauw, Agnes Desiree Maria, 3,825,763.
Stevens, J. P., & Co., Inc.: *See—*
Sello, Stephen B.; and Gaj, Bernard J., 3,825,630.
Stevenson, David Michael: *See—*
Belohoubek, Erwin Franz; and Stevenson, David Michael, 3,825,805.
Stillhard, Bruno: *See—*
Schwertfeger, Walter; and Stillhard, Bruno, 3,825,235.
Stobb, Anton R. Method for bundling, transporting, and feeding sheets. 3,825,134, Cl. 214-152.000.
Stock, Robert. Three dimensional reticulated structure. 3,825,465, Cl. 161-112.000.
Stockbridge, Bruce W.; and Spaller, Albert E., Jr., to Eastman Kodak Company. Apparatus for forming an interference pattern of multiple indentations in the interior wall of conveying tubes. 3,824,827, Cl. 72-123.000.
Stockbridge, John M., to General Motors Corporation. Accumulating lift-and-carry conveyor. 3,825,109, Cl. 198-219.000.
Stockton, Thomas Edward: *See—*
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Stolt, Jan; and Gerward, Christer, to Stal-Laval Turbin AB. Epicyclic gear. 3,824,872, Cl. 74-411.000.
Stone Conveyor, Inc.: *See—*
Stone, Guthrie B., 3,825,108.
Stone, Guthrie B., to Stone Conveyor, Inc. Conveyor assembly with convertible extrusions. 3,825,108, Cl. 198-204.000.
Storyboard Display, Inc.: *See—*
Gargas, Frank A., 3,824,723.
Stranzinger, Hermann. Floating element, floating assembly, and connecting bolt. 3,824,644, Cl. 14-27.000.
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Strickland, Robert E., to Water Rite Inc., mesnc. Soil moisture monitor. 3,824,844, Cl. 73-73.000.
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Smirnov, Mikhail Dmitrievich; Ershov, Boris Alexandrovich; Savitsky, Vladilen Nikolaevich; Breev, Boris DmitrievICH; Atkarsky, Anatoly Alexandrovich; Shardakov, Svyatoslav Viktorovich; Sinajuk, David Aronovich; Stukalov, Vladimir Nikolaevich; and Puzynya, eonid Vasilievich, 3,824,642.
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Carroll, John E.; and Stump, Carl E., 3,825,721.
Sturgeon, Larry O.; and Dueker, Leonard L. Cable tension preloader. 3,825,197, Cl. 242-54.00r.
Suddeutsche Kuklerfabrik Julius Fr. Behr: *See—*
Hahn, Johann, 3,824,903.
Suga, Yoshizo, to Nippon Kokan Kabushiki Kaisha. Temperature control system for rotary kilns. 3,825,405, Cl. 432-36.000.
Sugawara, Toshiaki: *See—*
Takeda, Isao; Mizuno, Masayuki; Sugawara, Toshiaki; Shimojima, Yukiji; and Horiguchi, Sadayuki, 3,825,660.
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Suh, John T.; and Schnettler, Richard A., to Colgate-Palmolive Company. Hydroxy-hydroxymethyl-substituted phenylalanine derivatives. 3,825,590, Cl. 260-519.000.
Sukhov, Evgeny Alexeevich: *See—*
Sinichenko, Anatoly Afanasievich; Romanenko, Anatoly Mikhailovich; Sukhov, Evgeny Alexeevich; and Markovsky, Grigory Fedorovich, 3,824,760.
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Supitilov, Michael C., to DuKane Corporation. Fluid flow sonic energy reactor. 3,825,481, Cl. 204-193.000.
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Suzaki, Kuniyoshi, to Canon Kabushiki Kaisha. Motion picture projector device loaded with a film cartridge. 3,825,330, Cl. 352-157.000.
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Swanson, Harold R.: *See*—
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Swanson, Marvin C.; and Swanson, Harold R. Charcoal grill conversion apparatus. 3,824,984, Cl. 126-25.00r.
Swett, James B.; and Ashton, Harold P., to Dart Industries Inc. Food grater. 3,825,049, Cl. 150-.500.
SWF-Specialfabrik fur Autozubehor Gustav Rau GmbH: *See*—
Hanselmann, Dieter; and Prohaska, Hans, 3,825,707.
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Tajika, Kazuya; and Shimizu, Hidenori, to Kawasaki Jukogyo Kabushiki Kaisha. Recoil starter for an internal combustion enginc. 3,824,979, Cl. 123-185.00a.
Takabayashi, Teruo, to Korin Limited. Connector or an adjuster. 3,824,654, Cl. 24-198.00.
Takada, Takezo, to Takata Kojyo Co. Ltd. Motor vehicle safety devices. 3,825,205, Cl. 242-107.400.
Takagi, Shigeru: *See*—
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Takagishi, Iwao: *See*—
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Takahashi, Sakari, to Nippon Electric Company, Limited. Method of producing insulated-gate field-effect semiconductor device having a channel stopper region. 3,825,455, Cl. 156-11.000.
Takahashi, Susumu: *See*—
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Takahashi, Toshinao, to Kabushiki Kaisha Sayama Seikakusho. Simplified filtering system. 3,825,120, Cl. 210-104.000.
Takahashi, Yasuo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Wide angle lens system. 3,825,321, Cl. 350-215.000.
Takaku, Sakae: *See*—
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Takehara, Masahiro: *See*—
Saito, Tadaomi; Takehara, Masahiro; Yamada, Kazuhiko; Yoshida, Ryonosuke; and Sasaki, Yukiko, 3,825,560.
Takenaka, Shigeo; Shimizu, Hitoshi; and Yamamoto, Kenichiro, to Nippon Kayaku Co., Ltd. Olefin oxidation catalyst. 3,825,502, Cl. 252-456.000.
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Taniguchi, Hideo, to Toyo Electronics Industry Corporation. Thermal printing head. 3,825,722, Cl. 219-216.000.
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Tatge, Harlan H. System for supplying washing machine nozzles. 3,825,187, Cl. 239-312.000.
Taylor, Alfred E. Method of making flexible molding strip. 3,825,459, Cl. 156-244.000.
Taylor, Brian W.: *See*—
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Taylor, Julian S. Reverse-osmosis pump. 3,825,122, Cl. 210-134.000.
Taylor, William D., to Rubbermaid Sales Corp. Waste receptacle having liner bag holders. 3,825,150, Cl. 220-63.00r.
Tazuke, Hideo; Kitahara, Toshio; and Kageyama, Hiroo, to Ajinomoto Co., Inc. Optical resolution of DL-tryptophan. 3,825,559, Cl. 260-326.14t.
Teach, Ted L., to Laserplane Corporation. Signal-seeking, power-driven mast for use in laser beam controls and surveying systems. 3,825,808, Cl. 318-266.000.
Teagno, Wladimiro: *See*—
Battaglia, Dino; Bergonzi, Mario; Teagno, Wladimiro; and Trevisiol, Franco, 3,825,880.
Teich, Rudor M. Flasher and delay headlight control system. 3,825,798, Cl. 315-83.000.
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Terao, Yoshikazu; and Ura, Junichi, to Victor Company of Japan, Ltd. Two stage tape extraction system having single driving power source. 3,825,944, Cl. 360-85.000.
Terayama, Mutsuo; and Yamamoto, Kenji, to Yamamoto Kagaku Gosei Kabushiki Kaisha. 7 Piperazinofluorans. 3,825,544, Cl. 260-268.0pc.
Terumoto, Masahiro: *See—*
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Thannhuber, Josef, to Einhell, Hans, Firma. Measuring instrument for the measurement of direct current or direct current voltage. 3,825,826, Cl. 324-146.000.
Tharman, Paul A., to Briggs & Stratton Corporation. Method of mass producing alternator stators for small engines. 3,824,682, Cl. 29-596.000.
The Reedy Company, Inc.: *See—*
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Thigpen, Ben B., to Western Geophysical Company of America. Towable seismic detector conveyance. 3,825,886, Cl. 340-3.00t.
Thoburn, Allan: *See—*
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Thomaides, Lazarus. Catalytic exhaust purifier for diesel engines. 3,824,790, Cl. 60-299.000.
Thomas, John D., Sr. Mobile, variable resistance football practice dummy. 3,825,260, Cl. 273-55.00r.
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Thompson, Robert Stanley: *See—*
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Thomson, E. Craig, to Electronics Corporation of America. Object detecting system. 3,825,745, Cl. 250-208.000.
Thomson, E. Craig. Scanner. 3,825,747, Cl. 250-216.000.
Thomson-CSF: *See—*
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Thorn Electrical Industries Limited: *See—*
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Tiger Vacuum Bottle Industrial Company, Limited: *See—*
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Togneri, Mauro Giuseppe; and Elliott, Harry Samuel. DC-to-AC and AC-to-DC converter systems. 3,825,816, Cl. 321-18.000.
Tokos, George M.: *See—*
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Tokyo Shibaura Electric Co., Ltd.: *See—*
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Tolle, Gunter. Sewing machine construction. 3,824,938, Cl. 112-70.000.
Toman, Donald J., to Tull Aviation Corporation. Compatible split-band distance measuring method and apparatus. 3,825,929, Cl. 343-6.50r.
Tomaszewski, Thaddeus W.: *See—*
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Topham, Arnold J. Feed trough with replaceable bottom. 3,824,962, Cl. 119-61.000.
Townsend Engineering Company: *See—*
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Townsend, Ray T., to Townsend Engineering Company. Face seal for food processing equipment. 3,825,272, Cl. 277-94.000.
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Trevisiol, Franco: *See—*
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Tsuchiya, Hiroyoshi; Tsuda, Yukifumi; Hayami, Heijiro; and Kotera, Hiroaki, to Matsushita Electric Industrial Company, Limited. Photographic image pick-up coding system. 3,825,678, Cl. 178-7.100.
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Tuccillo, Joseph J., to Pennwalt Corporation. White gold alloy. 3,825,419, Cl. 75-165.000.

Tucker, Council A., to American Telecommunications Corporation. Cord adapter for telephones. 3,825,882, Cl. 339-103.00r.

Tull Aviation Corporation: *See—*
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Tull, Herbert G., to Walfdorf, Hoerner, Corporation. Hydraulic compression circuits. 3,824,896, Cl. 91-404.000.

Tumbush, Gerald, to Bendix Corporation, The. Columnar display for electrical signals with digital signal limit set. 3,825,827, Cl. 324-103.00p.

Tuohey, Paul F.: *See—*
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Turco Engineering, Inc.: *See—*
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Turner, Leslie C.; and Cockreham, Harry, to Turco Engineering, Inc. Energy generation system adaptable for burning dust-type fuels. 3,824,937, Cl. 110-102.000.

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Uhl, Guenter; Oppenlaender, Knut; Fikentscher, Rolf; and Mueller, Richard, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Print pastes. 3,825,431, Cl. 106-20.000.

Ujiie, Akira, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for the manufacture of circular products. 3,825,054, Cl. 164-52.000.

UMC Electronics Company: *See—*
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Unimasco, Inc.: *See—*
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National Aeronautics and Space Administration; with respect to an invention of:
Walker, Dayton J.; Turnage, John E.; Linford, Rodney M. F.; and Cornish, Steve D. Flame detector operable in presence of proton radiation. 3,825,760, Cl. 250-372.000.
Navy: *See—*
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Uno, Naoyuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Automatically actuated light measuring system. 3,825,352, Cl. 356-226.000.

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Usui, Genichi: *See—*
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Vaccari, Franco. Ski boot. 3,824,713, Cl. 35-2.5al.

Vachuda, George W., to Texaco Inc. Molecular sieve selective adsorption process. 3,825,490, Cl. 208-310.000.

Vahlensieck, Hans-Joachim: *See—*
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Van De Plassche, Rudy Johan: *See—*
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van den Berg, Johan H.; and van Eekelen, Alex H. A., to Monroe Belgium N.V. Windshield wiper assembly. 3,824,648, Cl. 15-250.320.

van der Muelen, Wijbren: *See—*
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Van Diepenbroek, Alfred Erich Wibrandt, to Bronswerk-Apparatenbouw N.V., v/h Moring & Steenaart. Apparatus for purifying a gas. 3,824,768, Cl. 55-223.000.

van Eekelen, Alex H. A.: *See—*
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Van Heerden, Pieter J.: *See—*
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Van Venrooy, John J., to Sun Research and Development Company. Epimeric mixtures of the lactone 3, 6-dihydro-4,5-dimethyl-5-phenyl-alpha-pyrone. 3,825,572, Cl. 260-343.500.

Van Wandelen, Henri, to Photo-Control Corporation. Camera aiming structure. 3,825,748, Cl. 250-221.000.

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Vargiu, Silvio; Giovanni, Sesto S.; and Pitzalis, Mario, to Societa' Italiana Resine S.I.R. S.p.A. Process for the preparation of self-extinguishing epoxy resins. 3,825,522, Cl. 260-47.0ep.

Varian Associates: *See—*
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Varner, Malcolm E.: *See—*
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Vaughan, William A., Jr; and Clough, James, to International Playtex Corporation. Rubber overshoes. 3,824,715, Cl. 36-7.300.

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Veatch, Ralph W. Jr., to Amoco Production Company. Method and apparatus for fracturing of subsurface formations. 3,825,071, Cl. 166-308.000.

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Velasco, Gonzalo: *See—*
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Vepa AG: *See—*
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Verhoeven, Leonardus Adrianus Johannes, to U.S. Philips Corporation. Receiver for video signals. 3,825,680, Cl. 178-7.30r.

Versteeg, Gijsbert, to Imex A.G. Apparatus for the production of reinforcement. 3,825,163, Cl. 228-5.000.

Vestal, Charles R., to Marathon Oil Company. Preparation of aqueous solutions of polyacrylamides suitable for supplemented recovery of petroleum. 3,825,067, Cl. 166-275.000.

Vetter, Michael F.: *See—*
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Villiers, Elizabeth A.: *See—*
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Vince, Robert, to University of Minnesota, The Regents of the. ( )-9-(β-(3α-amino-2α-hydroxy) cyclopentyl)-6-substituted-purines and derivatives. 3,825,541, Cl. 260-253.000.

Vinson, Paul. Sensing device for controlling the movement of sheet stock. 3,825,204, Cl. 242-75.300.

Vinton, David S.: *See—*
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Visser, Peter J., to Clark Equipment Company. Linear actuator. 3,824,904, Cl. 92-128.000.

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Vlahakis, Eftichios Van, to Venus Laboratories, Inc. Dispenser assembly and method. 3,824,633, Cl. 4-109.000.

Vogan, John Edward; and Granatek, Edmund Stanley, to Bristol-Myers Company. Crystalline kanamycin tetra hydrochloride. 3,825,528, Cl. 260-210.00k.

Volkner, Wolfgang: *See—*
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Wada, Shigeru; Oi, Hidesaburo; Matsuzawa, Norio; and Nishimura, Hiroshi, to Mitsui Petrochemical Industries, Ltd. Process for polymerization of olefins and catalysts therefor. 3,825,524, Cl. 260-93.50s.

Wadley, Edward F.; Wesselhoft, Robert D.; and Hanner, Glen P., to Esso Research and Engineering Company. Isomerization of polymethylbenzenes. 3,825,611, Cl. 260-668.00a.

Wagner, John E.: *See—*
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Walker, Ivan D.: *See—*
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Walles, Wilhelm E., to Dow Chemical Company, The. Apparatus for filling and hermetically sealing thermoplastic containers under vacuum. 3,824,762, Cl. 53-88.000.

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Warman, Bloomfield James; Elliott, Kenneth Frederick; and Kennard, Jack Frederick, to GTE International Incorporated. Matrix-mounting frame for multi-contact electrical components. 3,825,800, Cl. 317-99.000.

Warner-Lambert Company: *See—*
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Warwick Electronics Inc.: *See—*
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Wata, Tadao; Yusawa, Motoyasu; and Sasaki, Juntaro, to Mitsui Petrochemical Industries, Ltd. Polymer composition stabilized against oxidation and light. 3,825,523, Cl. 260-47.0up.

Watanabe, Hiroaki; and Nakamoto, Soichi, to Canon Kabushiki Kaisha. Shutter for cameras. 3,825,942, Cl. 354-267.000.

Watanabe, Kiyoshi: *See—*
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Watanabe, Masazumi: *See—*
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Watanabe, Moriichi, to Nagoya Metallic Card Clothing Co., Ltd. Apparatus and process for transferring a fiber web. 3,824,650, Cl. 19-114.000.

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Watkin, Theodore: *See—*
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Watkin, Theodore, to Watkin, Theodore, Friedman, Maurice W. and Friedman, Alfred S. Apparatus for clipping folded articles of clothing and the like. 3,824,671, Cl. 29-211.00r.

Watt, Gordon James. Wankel engine cylinder generating machine. 3,824,746, Cl. 51-245.000.

Weaver, Peter Brinkerhoff. Carrier for pneumatic tube systems. 3,825,210, Cl. 243-34.000.

Weaver, Preston R., to UMC Electronics Company. Synchronous hysteresis motor. 3,825,780, Cl. 310-74.000.

Webb, George. Stored energy initiator type of fuze. 3,824,929, Cl. 102-74.000.

Webb, Joe A. Horse training apparatus. 3,824,961, Cl. 119-29.000.

Weber, Helmut; Aumuller, Walter; Weyer, Rudi; Muth, Karl; and Schmidt, Felix Helmut, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Benzenesulfonyl ureas and their use in treating diabetes. 3,825,665, Cl. 424-322.000.

Weber, Kurt; and Luethi, Christian, to Ciba-Geigy AG. Styryl compounds, processes for their manufacture and their use. 3,825,534, Cl. 260-240.0ca.

Weber, William A.; and Wellech, Edmund H., to Corning Glass Works. Spinnerette plates and spinnerette employing same. 3,825,456, Cl. 156-15.000.

Webster Electric Company, Inc.: *See—*
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Webster, Gordon A.: *See—*

Dobson, Richard N.; and Webster, Gordon A., 3,824,661.

Wechter, Margaret A.; and Shanks, Howard R., to Iowa State University Research Foundation, Inc. Ion-selective electrodes using tungsten bronzes as active element. 3,825,482, Cl. 204-195.00m.

Weedon, Gene C.; and Little, Edwin D. Antistatic fiber containing high molecular weight tris(b-hydroxyalkyl)-isocyanurate-alkylene oxide adducts. 3,825,619, Cl. 260-857.000.

Weil, Edward D., to Hooker Chemical Corporation. Side chain halogenated alkyl phenyl carbamates. 3,825,582, Cl. 260-471.00c.

Weinstein, Albert, to Westinghouse Electric Corporation. Sound trim apparatus for boat speedometer. 3,824,854, Cl. 73-185.000.

Weinstein, Burton Alan, to National Recreation Industries, Inc. Ski binking with automatic boot-to-ski return. 3,825,274, Cl. 280-11.35n.

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Weiss, Morris, to Barnes Engineering Company. Calibration device for a gas analyzer. 3,825,756, Cl. 250-343.000.

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Welsh, Alan B., to Jasper Electronics Manufacturing Company. Circuit arrangement for converting square waves into asymmetrical rectangular waves. 3,825,775, Cl. 307-268.000.

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Western Geophysical Company of America: *See—*
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Weston, Maurice. Multi-storey building. 3,824,752, Cl. 52-176.000.

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Wheeler, Dale Kenneth, to Black and Decker Manufacturing Company, The. Method of assembling an electric motor device and heat sink. 3,824,684, Cl. 29-596.000.

Whitaker, William J. Therapeutic chair for exercising back muscles. 3,824,991, Cl. 128-24.00r.

White, Dowell; and Craig, Daniel L. Telemetry method and apparatus. 3,825,733, Cl. 235-151.310.

White, John U. Apparatus for measuring luminescent radiation. 3,825,762, Cl. 250-458.000.

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Whitehill, Rex G.; Berchenbriter, Gerald D.; and Jensen, Winton D., to Wickers Corporation. Tensioning devices. 3,825,227, Cl. 254-161.000.

Whitlock, Larry K.: *See—*
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Wickam, Irwin Edward; and Perkins, Jerry K., to Speed King Manufacturing Company, Inc. Automatic crate filler. 3,825,106, Cl. 198-101.000.

Wickers Corporation: *See—*
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Wigby, Jon, to Burndy Corporation. Termination device for flat electrical conductors. 3,825,881, Cl. 339-97.00r.

Wightman, Lawrance W., to Emerson Electric Co. Continuous stroke tube insertion and expanding device. 3,824,668, Cl. 29-202.00d.

Wilde, Sheldon L.: *See—*
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Wilhelm, Frederick C., to Universal Oil Products Company. Method for simultaneously producing synthetic natural gas and high octane reformate. 3,825,487, Cl. 208-139.000.

Wilhelm, Frederick C., to Universal Oil Products Company. Dehydrogenation with a multi-component catalyst. 3,825,612, Cl. 260-668.00d.

Wilkinson, Lester: *See—*
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Willert, William H.; and Ro. Jai G., to Egan Machinery Company. Drive for twin screw extruder. 3,824,875, Cl. 74-665.0ga.

Williams, Frederick C., to Hughes Aircraft Company. High resolution bistatic radar system. 3,825,928, Cl. 343-5.00r.

Williams, John David. Method of surgically repairing damaged ear drums. 3,825,009, Cl. 128-334.00r.

Williams, John K., to Central Texas Iron Works, Inc. Gas and particulate solid material separating and solid material discharging apparatus. 3,824,771, Cl. 55-429.000.

Williams, Robert E.: *See—*
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Williams, Rodney A., to Campbell, J. A., Company. Gas and liquid separator. 3,824,765, Cl. 55-1.000.

Wilmot, Donald W., to Itek Corporation. Radiation sensing system. 3,825,350, Cl. 356-138.000.

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Wilson, William A. Motorized agricultural type carrier. 3,825,087, Cl. 180-6.480.

Wineman, Neal B. Auxiliary keyboard device for key-operated machine. 3,825,101, Cl. 197-19.000.

Winery Systems, Inc.: *See—*
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Winfield, Merle; deceased (by Paquette, Richard N.; Petitioner), to McCulloch Corporation. Method and apparatus for starting an internal combustion engine. 3,824,978, Cl. 123-179.000.

Wing, Charles E., Jr.: *See—*
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Wirt, Leslie Spencer; and Morrow, Duane Lloyd, to Lockheed Aircraft Corporation. Apparatus and method for the measurement of acoustic absorption and impedance. 3,824,842, Cl. 73-69.000.

Wirtz, Rainer, to Bosch, Robert, GmbH. Multi-phase thyristor inverter circuit. 3,825,813, Cl. 321-5.000.

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Wittenbrook, Lawrence S.; and Timmons, Richard J., to Scott, O.M., & Sons Company, The. Certain 3-halo-1,2,4-thiadiazoles and synthesis. 3,825,551, Cl. 260-302.0sd.

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Wolf, Edward L., to Eastman Kodak Company. High gain barrier layer solid state devices. 3,825,807, Cl. 357-30.000.

Wolowitz, William H. Composite inking and obliterating typewriter ribbon. 3,825,104, Cl. 197-172.000.

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Woodruff, Roy J. Method and apparatus for forming holes in earth and setting subterranean structures therein. 3,825,082, Cl. 175-211.000.

Woods, Lee O., to General Electric Company. Magnetically driven timer. 3,825,781, Cl. 310-90.000.

Woody, George D. Confection decorating machine and drive transfer. 3,824,950, Cl. 118-14.000.

Woollons, David John: *See—*
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Worthington, Harvey R., Jr.; Rawson, Edward B.; and Schwarzkopf, Daniel, to Searle Medidata, Inc. Two-way projection system for data input. 3,825,730, Cl. 235-92.00v.

Wright, Harold B., to Shenondoah Plastics Corporation. Method of manufacture of crown closures from thermoplastic material. 3,824,761, Cl. 53-41.000.

Wright, Richard B., to Wright Tool and Forge Company. Insulated socket tool handle assembly with reversible ratchet. 3,824,881, Cl. 81-63.000.

Wright, Thomas C.; and Kleinke, Bernard L. Apparatus for refrigeration systems. 3,824,803, Cl. 62-226.000.

Wright Tool and Forge Company: *See—*
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Wurm, Joseph G.; and Heylen, Paul R., to European Atomic Energy Community (Euratom). Method of transporting and processing irradiated fuel elements. 3,824,673, Cl. 29-403.000.

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Yablonski, Robert E.; Hager, George S.; and Campbell, William G., Jr., to Electronic Engineering Co. Of Calif. Computer tape sprocket drive with 40% pin and 60% frictional transmission. 3,824,870, Cl. 74-243.00r.

Yabuta, Keiichiro, to Nissan Motor Company Limited. Fluid pressure regulating device for automotive braking systems. 3,825,303, Cl. 303-6.00c.

Yakovlevich, Otari; Nikolaevich, Robert; Isidorovich, Ivan; and Georgievich, Mikhail. Plasmatron. 3,825,718, Cl. 219-121.00p.

Yale, Harry Louis; and Petigara, Ramesh B., to Squibb, E. R., & Sons, Inc. Certain dihydropyrido [2,1-β][1,3 benzodiazepines and benzodiazocines. 3,825,549, Cl. 260-294.80b.

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Yamamoto, Takashi; and Uchijima, Katsuo, to Asahi Glass Company, Ltd. Method for cross-linking copolymer of tetrafluoroethylene and propylene. 3,825,510, Cl. 260-87.50b.

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Yamato, Yukio; Terada, Koki; and Nakamura, Bungo, to Yamato Sanko Mfg., Co., Ltd. Drying and incinerating furnaces. 3,824,935, Cl. 110-13.000.

Yamauchi Rubber Industry Co., Inc.: *See—*
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Yamazaki, Harumichi: *See—*
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Yamazaki, Sakuzo, to Sankin Engineering Company Limited. Hank reeling machine. 3,825,196, Cl. 242-53.000.

Yanagisawa, Isao: *See—*
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Yard, John S., to Fischer & Porter Co. High-pressure electromagnetic flowmeter. 3,824,856, Cl. 73-194.0em.

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Yoshikawa, Takayuki; Hisada, Eiichi; and Hujii, Tooru, to Nippon Toki Kabushiki Kaisha (Noritake Co., Ltd.). Thin-walled carbonaceous honeycomb structures and process for making same. 3,825,460, Cl. 156-296.000.

Yoshinaga, Fumihiro: *See—*
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Zapos, Nick G. Football lighted goal posts. 3,825,261, Cl. 273-55.00r.

Zehner, George M., Jr., to General Partitions Mfg. Corp. Pilaster and wall partition combination. 3,824,747, Cl. 52-239.000.

Zenith Radio Corporation: *See—*
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Zerver, Hermann Jochen. Device for limiting a force to be conveyed by a lever effect. 3,824,880, Cl. 81-52.40r.

Zettler, William D.; and Johnson, Earl E. Chip guard for machine tools. 3,824,890, Cl. 90-11.00r.

Zillinger, Adam J., Jr. Adapter for a mig welder. 3,825,720, Cl. 219-130.000.

Zimmer Manufacturing Co.: *See—*
Johnston, L. Lyle, 3,824,630.

Zimmer, Robert E., to Addressograph-Multigraph Corporation. Sheet dispenser. 3,825,249, Cl. 271-109.000.

Zoecon Corporation: *See—*
Descoins, Charles E.; and Henrick, Clive A., 3,825,607.

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Andrews, Harry N., and H. W. Keller, to Westinghouse Electric Corp., Supporting fuel elements in a nuclear reactor. Re. 28,079, 7–23–74, Cl. 176—78.

Davidson, Per, to Sandvik Aktiebolag. Hot top casing for casting molds. Re. 28,080, 7–23–74, Cl. 106—38.230.

Keller, Herbert W.: *See*—
Andrews, Harry N., and Keller. Re. 28,079.

Landis Tool Co.: *See*—
Price, Ralph E. Re. 28,082.

Matsushita Electric Industrial Co., Ltd.: *See*—
Shinagawa, Matsuaki, and Nezu. Re. 28,083.

Nezu, Hiroyuki: *See*—
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Price, Ralph E., to Landis Tool Co. Means for adjusting the angular relation between a workpiece to be ground and a tool. Re. 28,082, 7–23–74, Cl. 51—165.

Sandvik Aktiebolag: *See*—
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Schoerner, Roger J., to Southwire Co. Insulated aluminum alloy magnet wire. Re. 28,078, 7–23–74, Cl. 174—120.

Shinagawa, Mutsuaki, and H. Nezu, to Matsushita Electric Industrial Co., Ltd. Electrolytic process of preparing pure hydrogen. Re. 28,083, 7–23–74, Cl. 204—129.

Southwire Co.: *See*—
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Transaction Technology, Inc.: *See*—
Travioli, Jerry E. Re. 28,081.

Travioli, Jerry E., to Transaction Technology, Inc. Electronic credit card acceptor. Re. 28,081, 7–23–74, Cl. 235—61.11.

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American Optical Corp.: *See*—
Armbruster, John T. 232,138.
Armbruster, John T. 232,145.

Andersson, Lars M., I. G. M. Strandell, and E. H. O. Svard, to Molnlycke AB. Bib. 232,134, 7–23–74, D2—226.

Arendt, Gernot, to Firma Deutsche Semperit Gummiwerk G.m.b.H. Tire or similar article. 232,171, 7–23–74, Cl. D12—142.

Armbruster, John T., to American Optical Corp. Ophthalmic chair. 232,138, 7–23–74, Cl. D6—22.

Armbruster, John T., to American Optical Corp. Adjustable headrest. 232,145, 7–23–74, Cl. D6—200.

Auer, Robert T.: *See*—
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Beelner & Thomas: *See*—
Rodreguez, Jose M. 232,139.

Bell Co., Inc., The: *See*—
Carr, Laurel E. 232,162.

Bemis, John E. II, and G. J. Knezovich. Ski skooter. 232,164, 7–23–74, Cl. D12—10.

Benjamin, Elizabeth, to Crystal Products Co., Ltd. Eyelash container. 232,159, 7–23–74, Cl. D9—171.

Bergquist, Thomas A., to Olin Corp. Stove burner. 232,149, 7–23–74, Cl. D7—136.

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Cibie, Pierre, to Cibie Vendome. Combined electric generator and light for bicycles. 232,186, 7–23–74, Cl. D48—24.

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Cognata, Larry M., to The Murray Ohio Mfg. Co. Combined housing, deflector and motor shroud arrangement for a rotary lawnmower. 232,184, 7–23–74, Cl. D40—1.

Conway, Ronald I., R. V. Jones, and D. L. Schaum, to International Business Machines Corp. Teller station printer. 232,194, 7–23–74, Cl. D64—11.

Conway, Ronald I., R. V. Jones, and D. L. Schaum, to International Business Machines Corp. Teller station printer. 232,195, 7–23–74, Cl. D64—11.

Cordell, Carl R., Jr. Boat storage compartment lid. 232,167, 7–23–74, Cl. D12—70.

Craig, Joseph S. Flag stand. 232,177, 7–23–74, Cl. D29—17.

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Diamond, John, and J. J. Schneider, to The Boeing Co. Twin engine helicopter. 232,170, 7–23–74, Cl. D12—73.

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Fenic, John G., D. L. Kime, W. C. Raridan, and R. C. Viemeister, to Chemineer, Inc. Right angle drive. 232,191, 7–23–74, Cl. D55—1.

Ford, James A., to Kirsch Co. Shelf spindle. 232,144, 7–23–74, Cl. D6—195.

Frisch, Natalie A., and H. J. Vallis. Cleated attachment for street shoes. 232,147, 7–23–74, Cl. D2—317.

Galietti, Samuel. Drapery slide for a curtain rod. 232,154, 7–23–74, Cl. D8—239.

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Gibson, Robert G., to Crane Cams Inc. Combined packaging and display container for automotive cams. 232,161, 7–23–74, Cl. D9—185.

Goffredo, Daniel L., and C. D. Shakley, to Chemcut Corp. Etcher cabinets. 232,189, 7–23–74, Cl. D55—1.

Hiller, Montague. Mobile frame for supporting a chemical closet or the like. 232,165, 7–23–74, Cl. D12—25.

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Langer, Renaud, to Ebauches Electroniques SA. Watch case. 232,163, 7–23–74, Cl. D10—37.
Leoni, Ray D., to United Aircraft Corp. Helicopter. 232,168, 7–23–74, Cl. D12—73.
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Luedtke, Warren J., to S. C. Johnson & Sons. Bottle. 232,158, 7–23–74, Cl. D9—167.
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Salsgiver, John P., to United Technical Corp. Design for mobile cart. 232,166, 7–23–74, Cl. D12—27.
Santoro, Ralph, to Emerson Electric Co. Support for the heating element of a radiant heater or the like. 232,175, 7–23–74, Cl. D23—127.
Schaefer, Hermann R., to Sperry Rand Corp. Electric shaver. 232,199, 7–23–74, Cl. D95—3.
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Zaintz, Murray. Game board. 232,179, 7–23–74, Cl. D34—5.

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32 3,824,721
64R 3,824,722
106.1 3,824,723
125G 3,824,724
3,824,725
132R 3,824,726

CLASS 42
1J 3,824,727
66 3,824,728
89 3,824,729

CLASS 43
17 3,824,730
17.5 3,824,731
42.05 3,824,732
54.5R 3,824,733
121 3,824,734

CLASS 46
243MV 3,824,735

CLASS 47
17 3,824,736

CLASS 51
8 3,824,737
9 3,824,738
3,824,739
33R 3,824,740
50PC 3,824,741
54 3,824,742
165R Re.28,082
165.71 3,824,743
170T 3,824,745
217A 3,824,744
245 3,824,746

CLASS 52
11 3,824,749
79 3,824,750
103 3,824,748
173 3,824,751
176 3,824,752
203 3,824,753
228 3,824,754
239 3,824,747
314 3,824,755
546 3,824,756
758D 3,824,757

CLASS 53
24 3,824,758
3,824,759
29 3,824,760
41 3,824,761
88 3,824,762
255 3,824,763

CLASS 54
71 3,824,764

CLASS 55
1 3,824,765
20 3,824,767
48 3,824,766
223 3,824,768
3,824,769
279 3,824,770
429 3,824,771

CLASS 56
7 3,824,772
369 3,824,773

CLASS 57
24 3,824,774
58.52 3,824,775
140J 3,824,776
149 3,824,777
157TS 3,824,778
162 3,824,779

CLASS 58
19R 3,824,789
23D 3,824,780
23R 3,824,781
38 3,824,782
88SC 3,824,783

CLASS 60
226A 3,824,784
3,824,785
243 3,824,786
248 3,824,787
274 3,824,788
299 3,824,790
303 3,824,791
411 3,824,792
641 3,824,793

CLASS 61
46 3,824,794
46.5 3,824,795
48 3,824,796
53.5 3,824,797
72.4 3,824,798

CLASS 62
123 3,824,799
186 3,824,800
201 3,824,801
217 3,824,802
226 3,824,803
238 3,824,804
320 3,824,805
374 3,824,806

CLASS 64
6 3,824,807
17A 3,824,808

CLASS 65
61 3,825,413

CLASS 66
50R 3,824,809
76 3,824,810
84 3,824,811
177 3,824,812

CLASS 68
12R 3,824,813
18R 3,824,814

CLASS 70
18 3,824,815
25 3,824,816
81 3,824,817
358 3,824,818
432 3,824,819

CLASS 71
29 3,825,414

CLASS 72
10 3,824,820
20 3,824,821
36 3,824,822
56 3,824,824
60 3,824,825
77 3,824,826
123 3,824,827
181 3,824,828
214 3,824,829
249 3,824,830
251 3,824,831
285 3,824,832
361 3,824,833
387 3,824,834
389 3,824,835

CLASS 73
1R 3,824,836
17R 3,824,837
23.1 3,824,838
40.7 3,824,839
45.3 3,824,840
61.4 3,824,841
69 3,824,842
71.5US 3,824,843
73 3,824,844
88.5R 3,824,845
100 3,824,846
132 3,824,847
136A 3,824,848
146.8 3,824,849
151 3,824,850
3,824,851
170A 3,824,852
181 3,824,853
185 3,824,854
194EM 3,824,856
194B 3,824,855
351 3,824,857
421R 3,824,858
422GC 3,824,859
431 3,824,860
432R 3,824,823
457 3,824,861
480 3,824,862
517A 3,824,863

CLASS 74
5.6D 3,824,865
61 3,824,866
230.17E 3,824,867
235 3,824,868
242.15R 3,824,864
243R 3,824,869
3,824,870
411 3,824,872
422 3,824,871
462 3,824,873
626 3,824,874
665GA 3,824,875
759 3,824,876
814 3,824,877
866 3,824,878
878 3,824,879

CLASS 75
84.5 3,825,415
123AA 3,825,416
128A 3,825,417
159 3,825,418
165 3,825,419
171 3,825,420

CLASS 81
52.4R 3,824,880
63 3,824,881
401 3,824,882

CLASS 82
1.2 3,824,883
30 3,824,884

CLASS 83
19 3,824,885
329 3,824,886
679 3,824,887

CLASS 84
1.01 3,825,666
3,825,667
1.17 3,825,668

CLASS 85
47 3,824,888

CLASS 89
6 3,824,889

CLASS 90
11A 3,824,891
11R 3,824,890
58B 3,824,892
62A 3,824,893

CLASS 91
369B 3,824,894
401 3,824,895
404 3,824,896
411A 3,824,897
416 3,824,898
491 3,824,899

CLASS 92
2 3,825,289
8 3,824,900
13.6 3,824,901
40 3,824,902
48 3,824,903
128 3,824,904
136 3,824,905

CLASS 93
1C 3,824,906
1R 3,824,907
8VB 3,824,908

CLASS 96
1PE 3,825,422
1R 3,825,421
1.4 3,825,423
48PD 3,825,424
60R 3,825,425
76R 3,825,426
90PC 3,825,427
91N 3,825,428
108 3,825,429
115R 3,825,430

CLASS 98
40A 3,824,910
40C 3,824,909
50 3,824,911
115SB 3,824,912

CLASS 99
298 3,824,913
302R 3,824,914
329RT 3,824,915
334 3,824,916
404 3,824,917
452 3,824,918

CLASS 100
35 3,824,919
53 3,824,920

CLASS 101
19 3,824,921
45 3,824,922
114 3,824,923
3,824,924
212 3,824,925
377 3,824,932
378 3,824,926
3,824,927
415.1 3,824,928

CLASS 102
74 3,824,929

CLASS 104
172BT 3,824,930

CLASS 105
369B 3,824,931

CLASS 106
20 3,825,431
21 3,825,432
38.23 Re.28,080
89 3,825,433

CLASS 108
51 3,824,933

CLASS 109
.01R 3,824,934

CLASS 110
13 3,824,935
99R 3,824,936
102 3,824,937

CLASS 112
70 3,824,938
79FF 3,824,939
121.2 3,824,940

CLASS 113
1D 3,824,941

CLASS 114
.5D 3,824,943
.5T 3,824,942
69 3,824,944
235WS 3,824,945

CLASS 115
12R 3,824,946

CLASS 116
114R 3,824,947
124R 3,824,948
137R 3,824,949

CLASS 117
33 3,825,435
33.5R 3,825,436
36.1 3,825,437
100B 3,825,438
106R 3,825,439
3,825,440
119 3,825,441
212 3,825,442

CLASS 118
14 3,824,950
31.5 3,824,951
56 3,824,952
75 3,824,953
429 3,824,954
500 3,824,955

CLASS 119
3 3,824,956
4 3,824,957
10 3,824,958
20 3,824,959
28 3,824,960
29 3,824,961
61 3,824,962

CLASS 123
8.45 3,824,968
8.47 3,824,963
32EA 3,824,966
3,824,967
3,824,969
3,824,983
32R 3,824,965
45R 3,824,970
75B 3,824,971
119B 3,824,973
136 3,824,974
139AC 3,824,975
148E 3,824,976
3,824,977
179S 3,824,978
185A 3,824,979
196AB 3,824,980

CLASS 124
11R 3,824,981

CLASS 125
16 3,824,982

CLASS 126
25R 3,824,984
113 3,824,985
360 3,824,986

CLASS 128
1R 3,824,987
2H 3,824,989
2V 3,824,988
2.06G 3,824,990
24R 3,824,991
3,824,992
25R 3,824,993
3,824,994
92B 3,824,995
156 3,824,996
3,824,997
157 3,824,998
185 3,824,999
194 3,825,000
214.4 3,825,001
218DA 3,825,002
218NV 3,825,003
275.1 3,825,004
283 3,825,005
287 3,825,006
296 3,825,007
327 3,825,008
334R 3,825,009
337 3,825,010
346 3,825,011
3,825,012
349B 3,825,013
360 3,825,014
404 3,825,015
419P 3,825,016
622 3,825,017

CLASS 130
30H 3,825,018
CLASS 132
7 3,825,020
88.7 3,825,021
CLASS 133
117A 3,824,972
CLASS 134
24 3,825,443
104 3,825,022
117 3,825,019
CLASS 135
5AT 3,825,023
20R 3,825,024
CLASS 136
6P 3,825,444
83R 3,825,445
114 3,825,446
166 3,825,447
CLASS 137
219 3,825,026
265 3,825,027
270 3,825,028
271 3,825,029
375 3,825,030
392 3,825,025
480 3,825,031
496 3,825,032
625.66 3,825,033
CLASS 138
30 3,825,034
109 3,825,035
174 3,825,036
175 3,825,037
CLASS 139
122W 3,825,038
CLASS 140
93A 3,825,039
CLASS 141
1 3,825,040
3,825,041
95 3,825,042
147 3,825,043
187 3,825,044
198 3,825,045
CLASS 144
142 3,825,046
CLASS 145
31R 3,825,047
50E 3,825,048
CLASS 148
12.1 3,825,448
172 3,825,449
175 3,825,450
3,825,451
CLASS 149
38 3,825,452
CLASS 150
.5 3,825,049
52R 3,825,050
CLASS 151
37 3,825,051
CLASS 152
353 3,825,052
CLASS 156
3 3,825,453
8 3,825,454
11 3,825,455
15 3,825,456
147 3,825,457
242 3,825,458
244 3,825,459
296 3,825,460
502 3,825,461
582 3,825,462
CLASS 160
328 3,825,053
CLASS 161
36 3,825,463
67 3,825,464
112 3,825,465
113 3,825,466
159 3,825,467
161 3,825,468
172 3,825,469
227 3,825,470
CLASS 162
147 3,825,471
CLASS 164
52 3,825,054
132 3,825,055
253 3,825,058
274 3,825,056
292 3,825,057
CLASS 165
1 3,825,059
11 3,825,060
70 3,825,061
111 3,825,062
146 3,825,063
179 3,825,064
CLASS 166
.5 3,825,065
261 3,825,066
275 3,825,067
305R 3,825,068
3,825,069
306 3,825,070
308 3,825,071
CLASS 172
7 3,825,072
710 3,825,073
803 3,825,074
CLASS 173
43 3,825,075
CLASS 174
11R 3,825,669
40R 3,825,671
73R 3,825,670
97 3,825,672
120SR Re.28,078
CLASS 175
5 3,825,076
57 3,825,077
3,825,078
3,825,079
65 3,825,080
73 3,825,081
211 3,825,082
394 3,825,083
CLASS 176
65 3,825,084
78 Re.28,079
CLASS 177
3 3,825,085
CLASS 178
5.4HE 3,825,673
5.6 3,825,674
6.7A 3,825,675
6.8 3,825,676
3,825,677
7.1 3,825,678
7.2 3,825,679
7.3R 3,825,680
23R 3,825,681
69G 3,825,682
69.5R 3,825,683
CLASS 179
1GQ 3,825,684
15A 3,825,685
1C 3,825,686
6R 3,825,688
6 3,825,687
7R 3,825,689
15AS 3,825,694
15AT 3,825,690
3,825,693
15BA 3,825,691
15BT 3,825,697
15A 3,825,695
3,825,696
16F 3,825,698
18BC 3,825,692
81R 3,825,699
107S 3,825,700
175.23 3,825,701
CLASS 180
5R 3,825,086
6.48 3,825,087
9.5 3,825,088
12 3,825,089
53R 3,825,091
64R 3,825,090
82R 3,825,092
119 3,825,093
125 3,825,094
CLASS 182
17 3,825,095
86 3,825,096
91 3,825,097
106 3,825,098
CLASS 184
6.12 3,825,099
CLASS 188
71.2 3,825,100
CLASS 195
29 3,825,472
36R 3,825,473
103.5R 3,825,474
104 3,825,475
127 3,825,476
CLASS 196
126 3,825,477
CLASS 197
19 3,825,101
55 3,825,102
164 3,825,103
172 3,825,104
CLASS 198
20C 3,825,105
101 3,825,,06
139 3,825,107
204 3,825,108
219 3,825,109
CLASS 200
35R 3,825,702
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56R 3,825,704
61.79 3,825,705
67G 3,825,711
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85A 3,825,707
144B 3,825,789
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192 3,825,709
331 3,825,710
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CLASS 204
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195M 3,825,482
195R 3,825,483
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84 3,825,111
310 3,825,112
386 3,825,113
507 3,825,114
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97 3,825,485
110 3,825,486
139 3,825,487
212 3,825,488
310 3,825,490
327 3,825,489
CLASS 209
73 3,825,115
141 3,825,116
330 3,825,118
CLASS 210
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23 3,825,493
97 3,825,119
104 3,825,120
132 3,825,121
134 3,825,122
138 3,825,494
232 3,825,123
330 3,825,124
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71 3,825,126
96 3,825,127
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15 3,825,128
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86A 3,825,132
148 3,825,133
152 3,825,134
313 3,825,135
331 3,825,869
350 3,825,136
515 3,825,137
522 3,825,138
731 3,825,139
768 3,825,140
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9 3,825,143
320 3,825,144
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69M 3,825,715
73 3,825,716
98 3,825,717
121P 3,825,718
130 3,825,719
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530 3,825,725
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44A 3,825,147
46R 3,825,148
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63R 3,825,150
94R 3,825,151
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183 3,825,156
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238 3,825,158
402.24 3,825,159
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67 3,825,161
74 3,825,162
CLASS 228
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50 3,825,165
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20R 3,825,176
26 3,825,178
CLASS 234
51 3,825,179
CLASS 235
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61.11E Re.28,081
61.11R 3,825,727
61.6R 3,825,726
78 3,825,180
88 3,825,181
92CN 3,825,729
92V 3,825,730
151.11 3,825,731
3,825,735
151.21 3,825,732
151.31 3,825,733
151.33 3,825,734
168 3,825,736
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201PF 3,825,739
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280 3,825,186
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498 3,825,188
568 3,825,402
590 3,825,189
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103R 3,825,742
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46.11 3,825,191
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55 3,825,198
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67.2 3,825,202
68.3 3,825,203
75.3 3,825,204
107.4 3,825,205
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197 3,825,208
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343 3,825,756
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366 3,825,758
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182 3,825,233
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191 3,825,235
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29.6TA 3,825,514
31.8M 3,825,515
37N 3,825,516
40R 3,825,517
42.13 3,825,519
42.52 3,825,518
45.75R 3,825,520
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47ET 3,825,521
47UP 3,825,523
78R 3,825,508
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87.5B 3,825,510
87.5R 3,825,511
92.8W 3,825,512
93.5S 3,825,524
112R 3,825,525
124R 3,825,526
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239.3A 3,825,532
239.3D 3,825,533
240CA 3,825,534
240G 3,825,535
243C 3,825,536
243R 3,825,537
244R 3,825,538
247.5R 3,825,539
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253 3,825,541
256.4F 3,825,543
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294.8E 3,825,547
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326.14T 3,825,559
326.45 3,825,560
332.3P 3,825,566
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340.2 3,825,567
340.6 3,825,568
340.9 3,825,569
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343.3 3,825,571
343.5 3,825,572
343.9 3,825,573
345.2 3,825,562
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345.5 3,825,563
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410.5 3,825,576
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453R 3,825,579
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876B 3,825,622
878R 3,825,621
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PATENT OFFICE
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